Resilience in Patients Undergoing Coronary Artery Bypass Graft (CABG) and Healthy Subjects

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Abstract

Background: One of the useful methods in heart surgery is Coronary Artery Bypass Graft (CABG). Nevertheless, hospitalization and surgery are accompanied by a large amount of stress and anxiety for patients. Resilience is one of the related variables with threatening experiences and stressors. The aim of the present research was determining and comparing resilience in patients undergoing CABG and healthy subjects based on personal and hospital factors.

Methods: In this descriptive cross-sectional study, the statistical population included all patients undergoing CABG admitted to hospitals in Tehran in 2018. The research sample included 85 patients with CABG and 85 healthy subjects (total of 170 subjects), who were selected from Hazrat-e Rasoul-e Akram Hospital and Imam Khomeini Hospital. The Conner-Davidson Resilience Scale and a personal and hospital factors checklist were used to collect the data.

Results: In this study, it was found that there was not a statistically meaningful difference between resilience distribution in CABG patients and healthy subjects (p≥0/05). Moreover, there was meaningful relationship between personal factors (age and occupation) and patients' resilience; also, there was no meaningful relationship between hospital factors and patients' resilience andin healthy subjects, the relationship between age and resilience was negative and meaningful, and between education and resilience was positive and meaningful.

Conclusion: Resilience is a capacity and skill which can be trained and learned. Based on the results, people who are more knowledgeable have more chance to improve their resilience. Therefore, concentrating and emphasizing on patients' resilience deserves more attention.

Keywords: CABG, Heart surgery, Mental health, Resilience

Introduction

Cardiovascular diseases are the main cause of death in the world. Based on recent national survey on death and morbidity in Iran, Ischemic Heart disease was the main cause of death in Iranian males and females and the leading cause of DALYs (1). However, the role of psychosocial factors such as depression, anxiety, social isolation, personality traits and stress has recently been proven and researchers of cardiovascular diseases have paid much attention to this area (2). Personal resilience makes the coping better with stressful conditions like cardiovascular disease and facilitates recovery from disease and therapeutic interventions (3). Additionally, patients with cardiac problems who have anxiety and depression are more likely to experience major adverse cardiac events, such as myocardial infarction and the probability of cardiac arrest and death (4).

While Coronary Artery Bypass Graft (CABG) is one of the safe and successful treatments for people who suffer from cardiac disease, hospitalization is a stressful and life-threatening experience associated with fear and anxiety for many patients. These patients face various physical, psychological and social stressors and the stress delays the recovery process (5).

The definition of resilience based on experts is a capacity to resist against the threatening conditions and stressful events. Newman considers the resilience as a process or ability to cope with challenges, threats, and overcome them (6). Hoge *et al* argue that resilience is not just a lack of mental disorder, but acquisition of the characteristics which help an individual maintain mental health when exposed to risk factors (7). Conner and Davidson view the resilience as the ability of an individual to establish a biomechanical balance in dangerous situations (8).

The present research was conducted to evaluate the level of resilience of patients undergoing CABG and answer the question about the individual and hospital factors associated with resilience. With identifying responsible factors in resiliency, the patients who need additional psychological support can be represented. Additionally, in order to recognize the resilience of patients undergoing CABG well, the resilience of these patients was compared with healthy subjects to determine if there is a significant difference between two groups in terms of resilience.

Materials and Methods

This descriptive research is a cross-sectional study. The research population included all patients undergoing CABG admitted to hospitals in Tehran in 2018. The research sample comprised 85 patients with CABG and 85 healthy subjects (total of 170 subjects), which were selected through non-random sampling from Hazrat-e Rasoul-e Akram Hospital and Imam Khomeini Hospital. The research inclusion criteria were being candidate for CABG according to the physician team's diagnosis and guidelines, being above 18 years of age and having willingness to participate in the study, ability of reading and answering the questionnaire, the absence of acute and chronic non-cardiovascular disease for case group, the absence of acute and chronic diseases for control group, completion of the resilience questionnaire and the checklist for both groups. The exclusion criteria of study included unwillingness to participate in the research and incomplete completion of the questionnaire and checklist for both groups and having frank psychosis or mood swing.

Instruments

A. Conner-Davidson Resilience Scale (CD-RISC) (2003): This questionnaire was developed by Conner and Davidson based on review of research on resilience from 1979 to 1991(8). Conner and Davidson calculated the internal consistency of this questionnaire by Cronbach's alpha as 0.89. They also reported the reliability of 0.87 using test-retest method by a four-week interval. This questionnaire was translated and standardized in Persian language in Iran and the psychometric properties of this questionnaire were reviewed and confirmed with Cronbach's alpha (0.89) (9). This questionnaire can distinguish between resilient and non-resilient people in clinical and non-clinical groups and can be used in research and clinical settings. This scale can be helpful in determining the level of resilience in a wide range of subjects and in qualifying changes in resilience during treatment. This questionnaire has 25 items, scored in a Likert scale ranging from completely false (0), somewhat false (1), I have no idea (2), somewhat true (3) and completely true (4). The minimum score in this questionnaire is zero and the maximum score is 100. As a subject obtains higher score, his resilience will be high. In the present study, the internal consistency of the questionnaire was calculated to be 0.91 using

Cronbach's alpha on the resilience scores of 30 cardiac patients.

B. Checklist for individual and hospital factors of resilience: In this checklist, variables such as gender, age, marital status, and number of children, level of education, job, and residence were considered as individual factors of resilience and the variables such as previous surgery, gender of physician (Female, male) and physician-patient relationship (Familiar as unfamiliar) were selected as hospital factors of resilience. Patients responded to individual and hospital resilience factors and healthy people responded to individual resilience factors.

Providing knowledge on the research objective for subjects, honesty in collecting and analyzing data, and confidentiality of the information of the individuals in the sample groups were some of the ethical considerations of this research. This research has ethical confirmation by ethics committee of Iran University of Medical Sciences.

Results

After data collection, data were entered into and analyzed by SPSS V.24 software. For analyzing data, independent t-test and chi square test were applied. Individual factors of the patient indicate that out of 85 patients, 59% were male, 41% were female, the minimum age of them was 22, and the maximum age of them was 91 years. Demographic charachteristics of participants are reported in table 1. Based on hospital factors, 49% had surgical history and 51% had no surgery and 76% of physicians were male surgeons and 24% were females and 49% of them knew their surgeon and 51% did not know him or her.

The data of individual factors of the healthy people also showed that out of total of 85 patients, 46% were male, 54% were female, their minimum age was 20 years, and their maximum age was 67 years.

The data on the resilience distribution in the two patient and healthy groups showed that in the patient group, the minimum resilience score was 18, the maximum score was 88, the mean was 59.27 and SD was 14.71. In addition, 26% had low resilience and 74% had high resilience. In the healthy group, the minimum resilience score was 27, the maximum score was 92, the mean was 62.63 and the SD was 14.44. In addition, 19% of them had low resilience and 81% had high resilience. Also, there was a significant relationship between individual factors and the resilience distribution in

patients undergoing CABG. Table 1 shows the results of Pearson correlation coefficient on individual factors and resilience of patients undergoing CABG.

Table 2 shows the results of independent t-test on resilience distribution among patients undergoing CABG and healthy subjects. As shown in table 2, it is concluded that the mean resilience score in two research groups is not significantly different. Thus, it can be stated that there is no significant difference between patients undergoing CABG and healthy subjects in terms of resilience distribution.

There is a negative and significant relationship between individual (age and job) factors and resilience in patients for resilience and age, which is significant at a level of 0.05. Moreover, as greater percentage of patients was employed, with 99% of confidence, it can be stated that there is significant and negative relationship between employment, compared to being unemployment and resilience.

As shown in table 3, there is no significant relationship between hospital factors and resilience in patients (p≥0.01). Thus, it can be concluded that the level of resilience of subjects does not change under the influence of surgery history, gender of surgeon, and familiarity with the surgeon.

The data in table 4 indicate that among the individual factors, there is a negative and significant relationship between age and resilience. In addition, there is a positive and significant relationship between education level and resilience of healthy subjects. Thus, it can be concluded that with increasing the age, the resilience decreases and vice versa. In addition, resilience increases with increasing levels of education.

Discussion

The research results showed no significant difference between the resilience distribution in patients undergoing CABG and healthy subjects.

Etesamipour and Amirpour found that healthy subjects had low depression and higher resilience compared to patients (10). Dustdar Tusi and Dabaghi showed that the level of resilience in healthy subjects was significantly higher than that of stroke and non-stroke cardiovascular patients (11). Malik and Afzal found that men with cardiovascular disease have higher resilience compared to women with cardiovascular disease (12). However, Noori *et al* did not observe

Table 1. Independent samples t test for comparing patient group and healthy group in resilience score

Variable	Groups	Number	Mean	std. Deviation	Levene's Test for Equality of Variances		t-test for equality of means		
							t	df	Sig. (2-tailed)
Resilience	Patient	85	59/27	14/71	F	Sig.	-1.947	168	0.053
	Healthy	85	63/62	14/44	0.009	0.925			

Table 2. Correlation between individual factors and resilience in patients (n=85)

Variable	Resilience	Gender	Age	Marital status	Number of children	Education	Type of Job	Residence (city/village)
Resil-ience	Patient	-0.122	-0.335**	-0.098	-0.186	0.046	-0.343**	-0.001
	Healthy	0.267	0.002	0.371	0.088	0.677	0.001	0.992

**Correlation is significant at the 0.01 level (2-tailed)
*Correlation is significant at the 0.05 level (2-tailed)

Table 3. Correlation between hospital factors and resilience in patients (n=85)

Variable	Previous surgery	Sex of surgeon	Knowing/not knowing the surgeon
Resilience	-0.145	-0.003	-0.098
	0.184	0.981	0.371

**Correlation is significant at the 0.01 level (2-tailed)
*Correlation is significant at the 0.05 level (2-tailed)

Table 4. Correlation between individual factors and resilience in healthy subjects (n=85)

Variable	Gender	Age	Marital status	Number of children	Education	Type of job	Residence (city/village)
Resilience	-0.040	-0.246*	-0.078	-0.084	0.256*	-0.172	-0.169
	0.716	0.024	0.477	0.445	0.018	0.117	0.121

**Correlation is significant at the 0.01 level (2-tailed)
*Correlation is significant at the 0.05 level (2-tailed)

significant difference between the subjects of patient group and the subjects of healthy group in terms of mean resilience score comparing the cardiovascular disease patients with healthy subjects (13).

Lack of significant difference between CABG patients and healthy people can be justified by the fact that first, resilience is a psychological capacity found in all individuals to cope with and tolerate the severe and stressful conditions and adverse events and overcome the life problems (14). Second, resilience is a capacity that its level varies in individuals, so that it can be reduced or increased over time and it is developed based on intellectual and practical self-correction in the process of trial and error of life (15). Therefore, resilience is not a capacity and skill developed instantaneously and temporality in facing with an adverse event and difficult conditions, but it develops over time with experiencingmany barriers and problems in life.

A significant relationship was found between age and job variables and resilience of CABG candidates. Regarding the age which has a negative and significant relationship with resilience in patients, it can be stated that resilience is the ability and capacity to resist and cope with stress and catastrophe. This resistance is affected by psychological well-being and physical well-being. Thus, the psychological and individual resilience level is reduced in elderly people as their physical strength decreases. Second, chronic disease, such as cardiovascular disease, requires CABG surgery, which might be disabling for the patient, especially the elderly people. Thus, it is natural that resilience would decrease in cardiovascular patients.

The presence of significant relationship between the resilience of CABG patients and their job position and type can be justified by the fact that majority of subjects reported their job "self-employed", so if it is assumed that self-employed people have better economic status compared to employed and retired people, it would be

natural that patients with better economic status would have less concern and stress to finance their life and hospital costs. This result was consistent with that of the research conducted by McCubbin and Gardashi (16,17). No significant relationship was found between hospital factors and resilience of CABG candidates. No study was found to examine the relationship between hospital factors and resilience of CABG candidates. However, it was reported that patients who did not sleep well in the hospital at the night before surgery, waited for more than two hours to enter the surgery room, and unemployed people who were not able to pay the hospital costs experienced high level of anxiety (17). Therefore, this result can not be generalized to all patients undergoing CABG surgery, and it cannot be stated that the resilience level of hospitalized patients has no relationship with hospital factors. Thus, further research is required to confirm this result.

A significant relationship was found between age and education variables and the level of resilience in healthy people. This result is consistent with that of the research conducted by Montazer Ghaem *et al* (18), Etesamipour *et al* (10), and Malik and Afzal (12). So, Montazer Ghaem *et al* found a significant relationship between level of education and quality of life in components of general health, physical health, social activity, vitality and psychological constraints (18). Etesamipour and Amirpour found that people with higher education level had higher resilience (10). Based on the results of the research conducted by Malik and Afzal, the quality of life of people can be improved by increasing level of education and resistance (12).

Conclusion

As stated in explaining the relationship between age and resilience of the patients, resilience is a mental and physical capacity to resist against the threatening conditions and to control stress successfully. Hence, it is natural that the resilience of elderly people to be reduced as their physical strength decreases. In addition, resilience is a capacity and skill which can be trained and learned. People who are more knowledgeable have more chance to improve their resilience. Therefore, the significant relationship between education level and resilience would be expected.

Limitations
This research has some limitations which requires caution in generalizing the results and their application. A total of 85 patients who were candidates for CABG surgery were selected from Hazrat-e Rasoul-e Akram Hospital and Imam Khomeini Hospital. A Questionnaire was used to measure resilience of the patients. Individual factors of resilience were limited to individual factors of gender, age, marital status, number of children, level of education, job, living place, and hospital factors of the resilience were limited to having surgery history, gender of surgeon, and familiarity with surgeon.

Suggestions
It is suggested to pay attention to the psychological readiness, especially the resilience of patients undergoing CABG surgery in the process of surgery, provision of care, and during the treatment. A hospital team including cardiologists and surgeons, psychiatrists, and health psychologists should be formed in order to provide information and trainings on measuring, maintaining and enhancing the psychological capacities of patients, and the ways of providing desirable care. Specialized and practical trainings need to be provided for patients on self-caring and the ways to control the stressors and the factors weakening the resilience. The relationship of other personal factors, such as personality traits, positive thinking, religious beliefs, and hardiness and the resilience of patients requires to be examined as well. Moreover, it is suggested that the relationship between other hospital factors, for example, the public or private nature of the hospital, the cost of the hospital, the quantity and quality of hospital facilities and equipment and the resilience of the patients be studied.

Ethical consideration
This study was approved by the ethics committee of the School of Medicine, Iran University of Medical Sciences, Tehran, Iran. The research was carried out in accordance

with the Declaration of Helsinki, including oral informed consent of all participants.

Conflict of interest

The authors declare that they have no competing interests.

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