■ Original article

Resilience and the associated factors in patients with coronary artery disease

Azam Nouri-Saeed[1], Arsalan Salari[2], Ali Nouri-Saeed[3], Leila Rouhi-Balasi[4], Fatemeh Moaddab[5,*]

Abstract

Background and Purpose: Coping strategies play a key role in the management of different diseases. Resilience and positive emotions in patients could enhance coping strategies and reduce disease complications. This study aimed to determine the level of resilience and the associated factors in patients with coronary artery disease (CAD).

Methods: This descriptive cross-sectional study was conducted on 186 CAD patients referring to Dr. Heshmat Hospital of Rasht in 2013. Data were collected using the Connor-Davidson Resilience Scale (CD-RISC), and data analysis was performed using descriptive and inferential statistics in SPSS.

Results: In this study, mean score of resilience was 65.50 ± 1.58 (out of 100), and 53.2% of the subjects had lower scores than the mean. Significant associations were observed between the resilience level and age, gender, education status, employment status and history of hypertension ($P<0.05$). According to the logistic regression, employment status was the only significant predictor of resilience.

Conclusion: According to the results of this study, since the majority of the subjects had lower scores than the mean of resilience, it is recommended that these patients be monitored for mental and psychological health. Furthermore, they should be trained on coping skills depending on their socio-demographic features.

Keywords: Coronary artery disease, Patients, Resilience

Introduction

Cardiovascular diseases account for the highest rate of mortality in different countries, including Iran (1). According to the World Health Organization (WHO), cardiovascular disorders will be the main cause of mortality across the world by 2020 (2). Coronary artery disease (CAD) is the most chronic and life-threatening form of cardiovascular diseases (3), responsible for one-third of the total deaths among individuals over 35 years of age (4).

In Iran, the prevalence of CAD and associated mortality and morbidity is on a rising trend (5). The report by the Iranian Ministry of Health shows CAD to be the first cause of death based on the total mortality rate, and the second cause of death based on the years of life lost (6). According to unofficial statistics, CAD kills 378 people on a daily average (7). In addition to the physical complications, CAD may lead to significant mental disorders in patients (8); anxiety and depression are among the major risk factors of CAD in this regard (8, 9).

[1] Department of Psychology, Science and Research Branch, Islamic Azad University of Guilan, Rasht, Iran
[2] Department of Cardiology, Guilan Interventional Cardiovascular Research Center, Heshmat Hospital, Guilan University of Medical Sciences, Rasht, Iran
[3] Department of Islamic Studies, Guilan University of Medical Sciences, Rasht, Iran
[4] Department of Nursing, Guilan Interventional Cardiovascular Research Center, Heshmat Hospital, Guilan University of Medical Sciences, Rasht, Iran
[5,*] Corresponding author: Department of Nursing, Guilan Interventional Cardiovascular Research Center, Heshmat Hospital, Guilan University of Medical Sciences, Rasht, Iran. Email: f.moaddab89@gmail.com

Excessive anxiety impedes recovery; consequently, cardiovascular patients with high levels of anxiety are more likely to experience complications such as arrhythmia, and higher risk of death within the early stages of their disease (10). Various non-medicinal methods could be used in order to alleviate stress and anxiety among CAD patients (5).

According to the literature, coping strategies play a pivotal role in the management of different diseases (11), and the type of strategies used by the patients could affect their physical and mental well-being (10). Coping strategies are applied in cognitive-behavioral therapy in order to control, manage and reduce stressors (11).

One of the most effective strategies used to promote the mental health of patients is resilience, which is closely correlated with religious and spiritual beliefs (12). In simple terms, resilience is defined as the "positive adjustment with adverse conditions and undesirable challenges" (11, 13-16). Resilience is a remarkable skill in dealing with unfavorable and difficult circumstances (11). In patients with different diseases, resilience could maintain positive emotions, enhance effective coping strategies and reduce disease complications (17, 18).

In one study, Fathi et al. claimed that improved resilience in cardiovascular patients resulted in higher satisfaction and quality of life in these individuals (13). In another research, Rahimian et al. and Bradshaw et al. evaluated patients with type 2 diabetes in terms of resilience, and this skill was reported to be a significant predictor of cardiovascular complications in these patients (18, 19). Furthermore, the results of the studies conducted by Achour et al., Jokar et al, Samani et al. and Khalatbari et al. were indicative of the key role of resilience in the improvement of mental health and life satisfaction in different patient populations (16, 20-22).

CAD is a highly prevalent disease with several adverse outcomes, and different personality traits and qualities, including resilience and coping strategies, could remarkably affect the course of this disease. Therefore, determining the resilience status and identifying the associated factors with this parameter are of paramount importance in the proper treatment and self-care of these patients, as well as to prevent complications and improve quality of life.

As an issue deserving of attention and a relatively novel perspective, resilience could dramatically promote the health care service of a society. This study aimed to define resilience and its associated factors in the patients presented with CAD in 2013.

Materials and Methods

This cross-sectional, descriptive, analytical study was conducted on the CAD patients referring to Dr. Heshmat Hospital of Rasht, located in Guilan, Iran. Convenience sampling was performed from September 2013 to January 2013; during this period, 186 eligible samples were selected for the study.

For this study, the sample size was calculated based on the results obtained by Achour et al. (20) (standard deviation=27.65, confidence interval (CI): 95%, margin of error: 5%) using the following formula.

$$N \geq \frac{(Z_{1-\alpha/2})^2 \times S^2}{d^2} = \frac{(1.96)^2 \times (27.56)^2}{5^2} = 116 \quad N \geq 186$$

To evaluate the association between resilience and socio-demographic and clinical features of the patients, five more samples were added to the final estimated size for every variable. Inclusion criteria of the study were as follows: 1) confirmed diagnosis of CAD by a specialist; 2) ability to speak Persian; 3) no history of neurological and mental disorders and 4) absence of hearing or visual impairments. Informed consent was obtained from all the participants, and they were granted the terms of confidentiality.

In the next step, socio-demographic data of the patients were collected, and the Connor-Davidson Resilience Scale (CD-RISC) was used to measure the resilience status. CD-RISC contains 25 items with 5-option Likert scales ("Never" to "Always"), and a score range of 0-4. In this test, the lowest score is 25 and the highest score is 100; higher scores imply higher levels of resilience. This method was applied in a study by Mohammadi conducted in 2005 in Iran (23), and the reliability has been

estimated at 0.87 by Samani et al. (2007) using the Cronbach's alpha (16).

Data collection was performed via interviews with the patients and reviewing their medical records by the researchers. The collected data were analyzed using descriptive and inferential statistics, correlation and Chi-square, Fisher's exact test and

logistic regression in SPSS, and normal distribution of data was measured using the Kolmogorov-Smirnov test (CI: 95%, power 90%).

Results

In this study, the mean age of the patients was

Table1. Correlations between Demographic Variables and Resilience

Resilience Status Variables		Above Mean Score (87) (46.8%)	Below Mean Score (99) (53.2%)	P-value
Gender	Female	17 (27.9)	44 (72.1)	0.001*
	Male	70 (56)	55 (44)	
Age	≤40	2 (33.3)	4 (66.7)	0.04**
	41-60	56 (54.9)	46 (45.1)	
	>60	29 (37.2)	49 (62.8)	
Marital Status	Married	87 (47)	98 (53)	0.53**
	Single	0	100 (1)	
Education Status	Read and Write	32 (33.7)	63 (66.3)	0.001**
	Under Diploma	30 (61.2)	19 (38.8)	
	Diploma	22 (56.4)	17 (43.6)	
	Bachelor and higher	3 (100)	0	
Employment Status	Household	12 (22.2)	42 (77.8)	0.001*
	Worker/Unemployed	9 (69.2)	4 (30.8)	
	Clerk/Retired	28 (58.3)	20 (41.7)	
	Self-employed	36 (52.2)	33 (47.8)	
Social Class	Low	24 (50)	24 (50)	$0.^{23}$**
	Average	62 (46.3)	72 (53.7)	
	High	1 (33.3)	2 (66.7)	
Insurance Status	Yes	135 (57.4)	100 (42.6)	0.44**
	No	3 (75)	1 (25)	
BMI	<19	4 (57.1)	3 (42.9)	0.83**
	19-25	27 (49.1)	28 (50.9)	
	26-30	36 (47.4)	40 (52.6)	
	>30	20 (41.7)	28 (58.3)	
Blood Type	A	22 (44.9)	27 (55.1)	0.8*
	B	16 (43.2)	21 (56.8)	
	AB	6 (60)	4 (40)	
	O	43 (47.8)	47 (52.2)	
Smoking History	Yes	37 (50.7)	36 (49.3)	$0.0^{0}8$*
	No	50 (44.2)	63 (55.8)	
Hypertension History	Yes	28 (35)	52 (65)	0.04**
	No	57 (54.8)	47 (45.2)	
MI history	Yes	23 (41.8)	32 (58.2)	0.44*
	No	62 (48.1)	67 (51.9)	

* Chi-square
** Fisher's exact test

Table 2. Regression Coefficient of Resilience Predictors based on Logistic Regression (LR method)

Predictors		β	SE	OR	95% CI		P-Value
					Min	Max	
Employment Status	Household	-1.34	0.41	0.26	0.12	0.58	0.001*
	Worker/Unemployed	0.72	0.65	2.06	0.58	7.34	0.26
	Clerk/Retired	0.25	0.38	1.28	0.61	2.69	1.28
	Self-employed	Reference	-	-	-	-	-

*Significance level: P<0.05

58.15±9.27 years, and the mean body mass index (BMI) was 27.12±4.71. The majority of the subjects were male (67.2%), married (99.5%) and within the age range of 41-60 years (54.8%). In addition, 51.1% of the subjects had the ability to read and write, 72.6% were from the middle social class and 38.2% were self-employed. Other measured parameters in the study included BMI of 25-30 (40.9%), O blood type (48.4%), no history of smoking (60.8%), hypertension (57%), diabetes (68.8%) and heart attack (70.4%).

The mean score of resilience was 65.5±1.58 (out of 100), and 46.8% and 53.2% of the patients achieved higher and lower scores than the mean, respectively.

Moreover, evaluation of the association between resilience and socio-demographic features was indicative of a statistically significant relationship between age (P<0.04), gender (P<0.001), education status (P<0.001), employment status (P<0.001) and history of hypertension (P<0.008) in the patients. Accordingly, the male subjects with the age range of 41-60 years, higher education levels and no history of hypertension were observed to have better resilience (Table 1).

According to the logistic regression using a likelihood ratio test (LR), employment status was identified as the only significant predictor of resilience, and housewives were observed to have lower resilience compared to self-employed subjects (OR: 0.26, CI: 0.12-0.58) (Table 2).

Discussion

In the present study, the mean score of resilience was 65.5, while it was estimated at 84.5 in the study conducted on cardiovascular patients by Fathi et al. (13). In another study by Mazloom et al. on diabetic patients, the mean score of resilience was calculated at 61.37 (11), and Hamid et al. reported this score to be 58.9 in a population of students (24). The differences in the mean of resilience score in the aforementioned studies could be due to the diversities in the study populations and samples, as well as different health conditions and disease severity.

In the current study, a significant relationship was observed between resilience and socio-demographic characteristics of the patients (age, gender, education status, employment status and history of hypertension). In this regard, the results obtained by Ghomi et al. were indicative of a statistically significant relationship between resilience, education status and age of the subjects (12). Furthermore, Achour et al. reported a statistically significant relationship between resilience and perceived social support (20), while Winsett et al. observed a statistically significant relationship between resilience and the parameters of age, race and overall life conditions among their subjects (25).

According to the findings of these studies, it seems that male and middle-aged patients, as well as those with higher education levels, tend to have better resilience, higher adjustment potential in case of challenges and stronger defensive mechanisms.

The findings of Jokar et al. are consistent with the results of the present study, which were indicative a statistically significant relationship between resilience and gender (22). On the other hand, the results obtained by Hashemi et al. (26) and Hamid et al. on student populations (24), Khalatbari et al. on health care staff (21), Winsett et al. on diabetic patients (using the 15-item Resilience Scale) (25) and

Pour-Sardar et al. on teachers (27) were indicative of no statistically significant relationships between resilience and gender. This inconsistency could be due to the differences in the study variables, applied methods, study populations and samples.

In the current study, regression analysis revealed employment status to be a significant predictor of resilience; accordingly, unemployed patients were observed to have lower resilience compared to self-employed patients. It is assumed that frequent encounters with challenges and hardships of life in the environmental circumstances in employed individuals could result in the acquisition of higher adjustment potential and resilience. In this regard, the results of regression analysis in the study by Hamid et al. denoted mental health and spiritual intelligence as the main predictors of resilience (24).

Moreover, the findings of Mahmoodi et al. indicated optimism and negative emotions to be the significant predictors of resilience among different patients (14). The differences in the reported predicting factors could be due to the discrepancies in the study variables, populations and samples. It is also noteworthy that the evaluation of employment status would have resulted in further conflicting results between the aforementioned studies and the present research.

Conclusion

According to the results of this study, about half of the subjects had lower resilience than the mean score. Given the key role of psychological factors and coping skills in the management of different disease, it is recommended that future studies be conducted on patients with chronic diseases, especially cardiovascular disorders. Furthermore, special attention should be given to the assessment of the mental health and psychological state of these patients, and they need to be trained on coping skills and resilience improvement depending on their socio-demographic factors.

Identification of the factors involved in the improvement of coping strategies is of paramount importance in different patient populations, and comprehensive studies are required in this regard.

Conflicts of interest

There were no conflicts of interest in this study.

Author's contributions

Nouri-Saeed: Study conception and design, data collection

Salari: Study conception and design

L. Rouhi Balasi: Data analysis

F. Moaddab: Manuscript draft and data analysis

Acknowledgements

References

1. Salarifar M, Kazemeini SM, Haji Zeinali AM. Prevalence of coronary artery disease and related risk factors in first degree relatives of patients with premature CAD. Tehran Univ Med J 2008; 65(1):49-54 (Persian).

2. Farkhani EM, Baneshi MR, Zolala F. Survival rate and its related factors in patients with acute myocardial infarction. Med J Mashhad Univ Med Sci 2014; 57(4):636-46 (Persian).

3. Hasanpour Dehkordi A, Motaarefi H, Afzali S. Stress Level and coping with in patients suffering myocardial infarction. J Gorgan Bouyeh Faculty Nurs Midwifery 2007; 4(1):15-20 (Persian).

4. Hanson MA, Fareed MT, Argenio SL, Agunwamba AO, Hanson TR. Coronary artery disease. Prim Care 2013; 40(1):1-16.

5. Momeni M, Ghasemi TM, Musarezaie A, Moeini M, Naji Esfahani H. The effect of spiritual care program on ischemic heart disease patients' anxiety, hospitalized in CCU: a clinical trial. Behav Sci Res 2012; 10(6):554-64 (Persian).

6. Shakeri J, Ghaderi N, Rezaee M, Saeedi M, Nalini M, Molodi A. The situation of psychosocial factors in patients with coronary artery disease in Kermanshah. J Kermanshah Univ Med Sci 2012; 16(3):246-54 (Persian).

7. Sabahi F, Akbarzadeh Tootoonchi MR. Comparative evaluation of risk factors in coronary heart disease based on fuzzy probability-validity modeling. J Zanjan Univ Med Sci 2014; 22(91):73-83 (Persian).

8. Saeed AN, Salari A, Saeed AN, Moadab F, Balasi LR. Spiritual intelligence and its related factors in patients

with ischemic heart disease. J Nurs Midwifery Sci 2014; 1(3):49-54 (Persian).

9. Nekouei ZK, Yousefy A, Doost HT, Manshaee G, Sadeghei M. Structural Model of psychological risk and protective factors affecting on quality of life in patients with coronary heart disease: A psychocardiology model. J Res Med Sci 2014; 19(2):90-8.

10. Pouranga P, Besharat MA. An investigation of the relationship between coping styles and psychological adaptation with recovery process in a sample of coronary heart disease patients. Pro Soc Behav Sci 2011; 30:171–5 (Persian).

11. Mazlum befruee N, Afkhami Ardakani M, Shams Esfandabadi H, Jalali M. Investigating the simple and multiple resilience and hardiness with problem-oriented and emotional-oriented coping styles in diabetes type 2 in Yazd city. J Zabol Nurs Midwifery 2012; 1(2):39-49 (Persian).

12. Hoseini Ghomi T, Salimi H. The relationship between religious orientation and resiliency among mothers of children with diseases. J Psychol Rel 2011; 4(3):69-82 (Persian).

13. Fathi A, Kheir M, Atigh M. Relationship between self-efficacy and quality of life due to the mediating role of resiliency in cardiovascular disease. Meth Mod Psychol 2011; 2(2):109-22 (Persian).

14. Mahmoodi J, Rahimi C, Mohamadi N. Factors affecting resilience in individuals exposed to trauma. Res Clin Psychol Counsel 2011; 1(1):5-14 (Persian).

15. Leppin AL, Gionfriddo MR, Sood A, Montori V, Erwin P, Zeballos-Palacios C, et al. The efficacy of resilience training programs: a systematic review protocol. Syst Rev 2014; 3(20):1-5.

16. Samani S, Jokar B, Sahragard N. Effects of resilience on mental health and life satisfaction. Iran J Psychia Clin Psychol 2007; 13(3):290-5 (Persian).

17. Tugade M, Fredickson BL, Barrett L. Psychological resilience and positive emotional granularity: Examining the benefits of positive emotions on coping and health. J Pers 2004; 72(6):1161-90.

18. Boogar ER. Risk factors for cardiovascular complications in patients with type II diabetes: Predictive role of psychological factors, social factors and disease characteristics. Health 2011; 13(3):278-93 (Persian).

19. Bradshaw B, Richardson G, Kumpfer K, Carlson J, Stanchfield J, Overall J, et al. Determining the efficacy of a resiliency training approach in adults with type 2 diabetes. Diabetes Educ 2007; 33(4):650-9.

20. Achour MR, Mohd Nor MR. The effects of social support and resilience on life satisfaction of secondary school students. J Aca Appli Stu 2014; 4(1):12-20.

21. Khalatbari J, Bahari S. Relationship between resilience and satisfaction of life. J Edu Psychol 2010; 1(2):83-94 (Persian).

22. Jowkar B. The mediating role of resilience in the relationship between general and emotional intelligence and life satisfaction. Contem Psychol 2008; 2(2):3-12 (Persian).

23. Mohamadi M. Factors affecting resiliency in individuals at risk for substance abuse. Tehran: Welfare and Rehabilitation Sciences Tehran; 2005 (Persian).

24. Hamid N, Babamiri M, Dehghani M. The relationship between mental health, spiritual intelligence with resiliency in student of Kermanshah University of Medical Sciences. Jentashapir. J Health Res 2012; 3(2):331-8 (Persian).

25. Winsett RP, Stender SR, Gower G, Burghen GA. Adolescent self-efficacy and resilience in participants attending a diabetes camp. Pediatric Nurs 2010; 36(6):293-6.

26. Hashemi L, Jowkar B. Study of Relationship between spiritual transcendence and resilience. J Educ Psychol 2011; 8(13):123-42 (Persian).

27. Poorsardar F, Abbaspoor Z, Abdi Zarrin S, Sangari A. Resiliency impact on mental health and life satisfaction, a psychological model of welfare. J Lorestan Univ Med Sci 2012; 14(1):81-9 (Persian).