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Article in *Acta Medica International* · January 2018

DOI: 10.4103/ami.ami_91_17

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Perceived Heart Risk Factors Can Predict Experienced Psychological Stress in Outpatient Cardiac Rehabilitation

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Abstract

Background: The study was done to investigate the role of perceived heart risk factors (PHRFs) in the prediction of psychological symptoms of cardiac rehabilitation (CR) patients. **Methods:** In this cross-sectional study, 124 CR patients referred to Kermanshah Hospital of Imam Ali were assessed during April–July 2015. PHRFs scale and Depression, Anxiety, and Stress scale-21 used for data collection. The data were analyzed using linear multiple regression analysis. **Results:** The mean age of samples (69.4% male) was 58.9 ± 9.7 years. The results of regression analysis evidenced that there is no significant relationship between any of the PHRFs with depression and anxiety ($P > 0.05$); however, biological ($P = 0.018$) and psychological ($P = 0.019$) risk factors significantly can predict stress. The model generally can explain 6.4% of the stress variance. **Conclusion:** PHRFs are included some significant predictors for experienced stress among the CR patients. Given that the biological and psychological risk factors are more effective in experienced stress by the patients, it is recommended that specialists pay more attention to the potential psychological outcomes of this group of patients.

Keywords: Cardiovascular disease, psychological symptom, rehabilitation, risk factor

INTRODUCTION

Psychological symptoms associated with cardiovascular diseases (CVDs) including stress, anxiety, and depression are among the most common illness outcomes^[1-3] that it is a challenge for various age and sex groups.^[4,5] The psychological symptoms that are major causes of CVDs in 34% of patients^[6,7] make a significant impact on physical functioning, disability, and quality of life of cardiac patients and high levels of these symptoms increase the risk of sudden cardiac death up to three times.^[1,2] Although in the secondary prevention referred to cardiac rehabilitation (CR) programs as an effective comprehensive approach to reduce physical and mental symptoms,^[4] the results of two studies showed that at the end of CR is not only not reduced depression and anxiety but also it will rise 10.7% and 16.7%.^[1,2] Hence, it seems that identifying factors associated with the symptoms can be effective in selecting the educational content of CR programs as well as early recovery of the patients.^[8]

Perceived heart risk factors (PHRFs) are as one of the components that, in recent years, studies have been referred

to it screening role for detecting psychological symptoms of cardiac patients,^[1,8] and it seems that the wider review of these factors can contribute to present knowledge in this field. According to Komasi and Saeidi suggestive model (2015), PHRFs consist of five categories including biological (gender, age, and family history), psychological (stress, anger, depression, and anxiety), environmental (pollution water and air, smoke and toxic substances, and war between countries), physiological (obesity, diabetes mellitus, high cholesterol, and high blood pressure), and behavioral factors (malnutrition, physical work pressure, smoking and substance abuse, and lack of exercise).^[5,8] According to the researchers' report, perceived physiological and psychological risk factors have a decisive role in identifying anxiety and depression among cardiac patients.^[3,8] Thus, since to identify factors associated

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Access this article online

Quick Response Code:



Website:
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DOI:
10.4103/ami.ami_91_17

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How to cite this article: Saeidi M, Komasi S, Soroush A, Heydarpour B. Perceived heart risk factors can predict experienced psychological stress in outpatient cardiac rehabilitation. *Acta Med Int* 2018;5:35-8.

with psychological symptoms of patients in the secondary prevention can be effective in physical recovery and return to normal life, it seems necessary to further study the relationship between PHRFs and psychological symptoms. Based on these considerations, we have designed this study to investigate the role of PHRFs in the prediction of psychological symptoms of CR patients.

METHODS

In the cross-sectional study, 124 cardiac patients after referral to the CR of Kermanshah Hospital of Imam Ali (Western Iran) were invited to participate in the study during April–July 2015. The sample size required using the formula ($N > 50 + 8m$) was calculated and verified.^[9] Inclusion criteria included age 30–80 years and no physical limitations to regular exercise. Data collection began after written informed consent to participate in the study. At first, demographic information and medical records of the patients were evaluated and recorded by the doctor of CR unit at 1 week before the start of exercise. At this phase, validated scales including PHRFs^[10] and Depression, Anxiety, Stress Scale^[11] were delivered to the patients by a clinical psychologist. The data were analyzed using Pearson's *r* correlation coefficient and linear multiple regression analyzes to examine the correlation between predictor and dependent variables (SPSS20 for Windows (IBM SPSS, Armonk, NY, USA) software). Before the regression analysis, nonviolation of all statistical assumptions (normality and outliers, linearity, independence of errors, and homoscedasticity) was checked and confirmed. All statistical tests were two sided; $P \leq 0.05$ was considered statistically significant.

The perceived heart risk factors scale

The PHRFS is a 24-item self-report scale recently developed by Saeidi and Komasi.^[10] It consists of five subscales that evaluate biological (three items), environmental (five items), behavioral (six items), psychological (seven items), and physiological risk factors (four items). Subscale total scores can be combined into a total score. Each item is rated on a 5-point Likert-type scale (0: never–4: very great), with higher scores indicating higher perceived risk factors. PHRF showed a moderate-to-good internal consistency (Cronbach's alpha for the total scale and subscales was 0.93, 0.63, 0.83, 0.82, 0.83, and 0.97, respectively), as well as a good content and construct validity.^[10] In the present study, the internal consistency was 0.932.

The Depression, anxiety, and stress scale-21

This DASS is a 21-item self-report measure of psychological distress, originally developed by Lovibond and Lovibond.^[11] It consists of three subscales that evaluate depression (seven items), anxiety (seven items), and stress (seven items). Each item is rated on a 4-point Likert-type scale (0 = did not apply to me at all and 3 = applied to me very much or most of the time). A previous study reported a good Cronbach's alpha and a good convergent validity with Beck Depression Inventory for the DASS.^[12] In the present study, the internal consistency was 0.868.

RESULTS

The range of age was 33–79 years with the mean (\pm standard deviation) 58.9 ± 9.7 years for all participants. Descriptive findings of the samples are visible in Table 1.

In conjunction with the main analysis, the results of correlation between PHRFs and psychological symptoms are specified in Table 2. As can be observed, there is no significant relationship between any of the PHRFs with depression and anxiety ($P > 0.05$). Thus, the components cannot enter regression analysis. Furthermore, the results of Table 2 revealed that the biological ($P = 0.019$) and psychological ($P = 0.016$) risk factors significantly associated with stress.

The results of regression analyses for stress are specified in Table 3. In the regression model for stress, *P* values associated with biological ($\beta = 0.253$, $P = 0.025$) and psychological risk factors ($\beta = 0.301$, $P = 0.033$) are significant. Thus, these risk factors are the most powerful predictors of stress. In total, the model summary shows that biological and psychological risk factors are significantly able to predict stress ($F = 4.155$, $P = 0.018$) and generally can explain 6.4% of the stress variance.

Table 1: Demographics and clinical data of the participants

Variables	Total (n=124)
Sex (male) n (%)	86 (69.4)
Marital status, n (%)	
Single	1 (0.8)
Married	109 (87.9)
Divorced	14 (11.3)
Education, n (%)	
Middle school or less	86 (69.3)
High school	25 (20.2)
University	13 (10.5)
Job, n (%)	
Employee	11 (8.9)
Self-employed	52 (41.9)
Housekeeper	36 (29.0)
Retired	25 (20.2)
Smoking, n (%)	
Never	86 (69.4)
Cessation	37 (29.8)
Active	1 (0.8)
Substance abuse, n (%)	
Never	116 (93.5)
Cessation	7 (5.6)
Active	1 (0.8)
Alcohol drinking, n (%)	
Never	115 (92.7)
Cessation	7 (5.6)
Active	2 (1.6)
Hypertension, n (%)	52 (41.9)
Diabetes, n (%)	33 (26.6)
Hyperlipidemia, n (%)	35 (28.2)
Myocardial infarction history, n (%)	22 (17.7)
Family history, n (%)	51 (41.1)

Table 2: The correlation between variables

PHRFs	Depression		Anxiety		Stress	
	<i>r</i>	<i>P</i>	<i>r</i>	<i>P</i>	<i>r</i>	<i>P</i>
Biological risk factors	0.116	0.198	0.158	0.079	0.211	0.019
Environmental risk factors	-0.061	0.501	-0.107	0.239	-0.011	0.904
Behavioral risk factors	-0.042	0.641	0.043	0.637	0.071	0.433
Psychological risk factors	0.048	0.579	0.112	0.216	0.217	0.016
Physiological risk factors	-0.036	0.695	0.045	0.622	0.116	0.201

PHRFs: Perceived heart risk factors

Table 3: The regression analyses for prediction of psychological symptoms

PHRFs	<i>B</i>	β	<i>t</i>	<i>P</i>
Biological risk factors	0.364	0.253	2.127	0.025
Psychological risk factors	0.285	0.301	2.011	0.033

Summary of the model for stress: $R=0.253$, $R^2=0.064$, $F=4.155$, $P=0.018$.

PHRFs: Perceived heart risk factors

Discussion

This study was done to investigate the role of PHRFs in the prediction of psychological symptoms of CR patients. The results of the present study showed that PHRFs, especially biological and psychological risk factors, are effective in predicting the experienced stress by CR patients. These findings are in line with previous reports.^[3,8,13,14] In relation to uncontrollable risk factors, we can refer to the viewpoint of Michie *et al.*^[15] According to the researchers, having a feeling of control over the health consequences decreases the level of mental pressure.^[15] Thus, it is natural to relate between uncontrollable risk factors and psychological symptoms such as stress.

The relationship between actual and perceived psychological risk factors is also consistent with previous studies.^[13,14] Apart from the fact that a significant proportion of cardiac patients consider the psychological factors as the etiology of their illness,^[6,7] usually those who really experience more stress identify the factors as an etiology.^[3,13,14]

Clearly, the causal attitudes of patients in all stages of the illness such as identification of the disease signs and causes and modifying unhealthy behaviors has a important impact on the progression of the disease and it can play a decisive role in the health behavior of patients.^[6-8,13,16] Given that the causal attributions of patients can independently predict the severity of psychological symptoms, evaluation of the patient's perception of the cause of illness likely is effective in the design of therapeutic intervention for them and may dramatically increase CR results.^[3,8] Generally, it seems that screening and scanning of psychological symptoms by the PHRFs during CR program has a significant impact on the quantity and quality of health care.^[3,5,8]

We used DASS for assess anxiety that was unable to distinguish between trait and state anxiety. Furthermore, this instrument

is not capable of evaluating the stress caused by life events. Therefore, it is better to use more appropriate tools in future studies. Due to the limited number of patients referred to outpatient CR, repeat this study in the phase of hospitalization can facilitate the generalization of the findings.

Conclusion

PHRFs are included some significant predictors for experienced stress among the CR patients. Given that the biological and psychological risk factors are more effective in experienced stress by the patients, it is recommended that specialists pay more attention to the potential psychological outcomes of this group of patients.

Acknowledgment

It is hereby deemed necessary to thank and appreciate the staff and patients of Cardiac Rehabilitation Unit of the Imam Ali Hospital of the Kermanshah University of Medical Sciences.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

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