



**International Journal of Biology, Pharmacy  
and Allied Sciences (IJBPAS)**

*'A Bridge Between Laboratory and Reader'*

[www.jibpas.com](http://www.jibpas.com)

---

---

**PSYCHOLOGICAL CONDITION IN HEART PATIENTS WITH DIABETES AND  
HYPERTENSION**

**SOMAYE NAGHAVI<sup>1</sup>, DAVOUDKAZEMI-SALEH<sup>2</sup>, MEHDI SABERI<sup>3\*</sup> AND  
ESMATNAGHAVI<sup>4</sup>**

**1:** Faculty of Psychology and Education, Department of Psychology, University of Tehran,  
Tehran, Iran

**2:** Artherosclerosis Research Centre, Baqiatallah University of Medical Science, Tehran, Iran

**3:** Faculty of Pharmacy, Department of Pharmacology and Toxicology, Neurosciences Research  
Center, Baqiatallah University of Medical Science, Tehran, Iran

**4:** Faculty of Psychology and Education, Department of Psychology, University of Payam Noor  
Qom, Qom, Iran

**ABSTRACT**

Heart diseases are common in population with diabetes and hypertension. Depression, anxiety and stress prevalent in patients with diabetes and hypertension and also psychological problems are the risk factors for heart diseases especially cardiovascular disease. The aim is study of psychological issues in heart patients with hypertension and diabetes.

the 144 heart patients were participated in this study. 38 patients had diabetes comorbidity with their heart disease, 44 of them had hypertension, 30 patients had diabetes and hypertension comorbidity with heart disease and 32 of them had none of comorbidity with their heart disease. The depression, anxiety and stress scale was used for collecting data. Frequency and variance analysis were used for analyzing the data.

The patients with hypertension and diabetes that showed severe depression, anxiety and stress were higher than other groups. The number of patients that didn't have any comorbidity with their heart disease in normal psychological condition was higher than other groups. Variance analysis showed the differences between groups.

---

In this study, patients with hypertension and diabetes comorbidity with heart disease were at a higher risk for psychological problems.

**Keywords: Heart Disease, Diabetes, Hypertension, Depression, Anxiety, Stress**

## INTRODUCTION

Coronary heart disease is the leading cause of death around the world (1). Mortality because of cardiovascular disease is very high but it decline each year in both gender (2). Both of incidences and prevalence of coronary artery disease rise with increasing age (3). But some studies indicated that coronary heart disease decrease in high-income countries because of reduction of some risk factors such hypertension and diabetes in population because of improved therapeutic options (4,5, 6). Evidence showed that psychological conditions such as, depression (7), anxiety and stress have a very important role in the etiology, growth and outcome of heart disease(8, 9,10,11). Psychological symptoms that are prevalent in heart patients, lead to increasing mortality rate in patients(12). According to world health organization epidemic of diabetes increase in the developing countries, and most studies pointed out that anxiety and depression are common disorders in people with diabetes than others (13,14). Furthermore, depression increases risk of mortality in people with diabetes(15,16). Evidence has revealed that heart disease is prevalent in type 2 diabetes

mellitus(17,18). CHD is the main cause of death in both type 1 and type 2 diabetes mellitus (19). Mortality rate is increased in diabetic women more than men. Some risk factors such as, plasma cholesterol, blood pressure and smoking are important for cardiovascular mortality in diabetic patients(17,20). Hypertension is a major risk factor for cardiovascular disease (21) and accelerates significantly the development of atherosclerosis (22). In addition, diabetes is related to prevalence of hypertension in heart patients (19). This relation is bidirectional because hypertension also is the main cause of death among patients with diabetes mellitus and reoccurring of CHD (23). Studies are suggested that there is significant association between hypertension and psychological disorders such as depression, anxiety and stress(24,25,26).

Because of the impact of hypertension and diabetes in heart diseases and in addition psychological issues are common in hypertension and diabetes patients, the aims of the present study were to investigate: 1) whether depression, anxiety and stress impact the heart patients with diabetes or

hypertension; 2) whether depression, anxiety and stress are different in patients with hypertension or diabetes and both of them.

## METHODOLOGY

The study population consisted of one hundred and forty four heart patients that were collected from Baqiat-Allah hospital in Tehran and Shahid Beheshti hospital in Qom between October 2013 and February 2014, and who consented to participate in the study, were conveniently collected. The mean age of the total sample was  $57.66 \pm 7.26$  years. 38 patients had diabetes comorbidity with their heart disease, 44 of them had hypertension, 30 patients had diabetes and hypertension comorbidity with heart disease and 32 of them had none of comorbidity with their heart disease.

Clinical variables were obtained from the patients' medical records that comprised comorbidities (Diabetes, Hypertension). There were inclusion and exclusion criteria. Inclusion criteria: 1- Being in the age group between 41 to 70 years; 2- patients informed consent to participate in the study. Exclusion criteria: 1- history of any cardiac surgery; 2- having an important psychological disorder; 3- being under the psychological treatment; 4- having addiction to any drug.

For data collection, the following instrument was used: Depression, anxiety and stress

survey (DASS-21) that has been used for assessing the level of anxiety, depression and stress of patients. In 1995, this questionnaire, for the first time, has been presented by Loviband and Loviband (27). The first form of this questionnaire has 42 questions, but in this research the form that has 21 questions, is used and validity of this scale in Iran, has been assessed by (28) on the population of Mashhad that the validity of depression 0/7, anxiety 0/66 and stress 0/76 has been reported in it.

Variance analysis was used for comparing depression, anxiety and stress' means between groups. Descriptive static was used to report frequencies of depression, anxiety and stress in groups.

## RESULTS

The sample participants had an average age of 57.66 years. Most of them were male (80 patients) and 64 patients were female. Also, all of the patients were married. **Table 1** shows the patients baseline characteristics.

**Table 2**, shows the frequencies of depression, anxiety and stress in four groups. More patients in four groups showed moderate depression. 11 Patients with hypertension and diabetes comorbidities with heart disease have severe depression. 19 patients with hypertension and diabetes showed severe anxiety. Moderate stress is higher in patients

with diabetes than other groups. Also, 1 patient in group without any of comorbidities showed moderate stress.

Table 3, showed the differences between groups. Stress, anxiety and depression are different between groups.

Table 1: Baseline characteristic for the total sample

Disease	Gender		total
	Men	Women	
Diabetes	19	20	39
Hypertension	23	21	44
Diabetes, hypertension	20	10	30
None of them	18	13	31
total	80	64	144

Table 2: frequencies of depression, anxiety and stress between groups

Variables		diabetes	hypertension	Hypertension,diabetes	None of them
Depression	normal	%29/7(11)	%18/1(8)	0	%58(18)
	Mild	%24/3(9)	%27/3(12)	%22/2(6)	%32/3(10)
	Moderate	%45/9(17)	%52/2(23)	%37(10)	%9/6(3)
	Severe	0	%2/3(1)	%40/7(11)	0
	Extremely severe	0	0	0	0
Anxiety	normal	%18/9(7)	%11/3(5)	0	%35/5(11)
	Mild	%16/2(6)	%22/8(10)	%3/7(1)	%29(9)
	Moderate	%40/5(15)	%47/7(28)	%18/5(5)	%29(9)
	Severe	%24/3(9)	%18/1(8)	%70/3(19)	%6/4(2)
	Extremely severe	0	0	%7/4(2)	0
stress	normal	%27(10)	%36/4(16)	%14/8(4)	%80/8(25)
	Mild	%21/6(8)	%27/2(12)	%14/8(4)	%16/1(5)
	Moderate	%51/3(19)	%36/4(16)	%33/3(9)	%3/2(1)
	Severe	0	0	%37(10)	0
	Extremely severe	0	0	0	0

Table 3: variances analysis of stress, depression and anxiety between groups

variables		Sum of square	df	Mean square	f	sig
Stress	Between groups	14154.670	3	484.890	22.558	0.000
	Whithin groups	2901.833	140	21.495		
	total	4356.504	143			
Depression	Between groups	1260.704	3	420.235	22.022	0.000
	Whithin groups	2576.088	140	19.082		
	total	3836.791	143			
Anxiety	Between groups	689.127	3	229.709	22.798	0.000
	Whithin groups	1360.255	140	10.076		
	total	2049.381	143			

## CONCLUSION

Nowadays, cardiovascular disorders are being more common in developing countries in comparison with developed ones. This ailment sometimes accompanied with other medical problems such as diabetes and

hypertension. The goal of the present study was to elucidate the probable synergistic effect of stress, anxiety and depression in heart patients as well as with and without hypertension and diabetes. Diabetes itself is a risk factor for heart disease and stroke. Also,

many people with diabetes have other conditions that increase their chance of developing heart disease and stroke. These conditions are called risk factors. Three corresponded factors which affect physiological state of the stricken people studied in the current paper were depression, anxiety and stress. Based on achieved data the authors acclaim that patients with hypertension and diabetes co morbidity with heart disease are at higher risk for psychological problems than other groups. These conditions bring about other risk factors and the patient suffers from damaging psychological issues. We implied that patients with hypertension and diabetes showed severe depression, anxiety and stress higher than other groups. The group of patients with any other inconvenience beyond heart disease has normal psychological condition and was the most among the all. All of the above mentioned observations are in good agreement with the previous reports such as Nicholson, Pelle, et al. According to our findings we conclude that depression; anxiety and stress impact the heart patients with diabetes hypertension and may amplify heart deficiencies. From variance analysis it can be seen that there is remarkable difference between groups. This result is consistent with previous reports too. Although

originally the effects like depression, anxiety and stress have different trends in patients with hypertension or diabetes and both of them. Studies show that psychological conditions such as, depression anxiety and stress have a very important role in the etiology, growth and outcome of heart disease, so it must be controlled in these patients. Studies suggest that there is clear and meaningful connection between studied risk factors like heart disease and psychological disorders such as depression, anxiety and stress. These kinds of scrutiny exaggerate the importance of health homeostasis among the patients with heart problems and aware the specialists of these fields to do more research socially and medically to help them live healthy with fewer inconveniences. Heart attacks in people with diabetes are more serious and more likely to result in death.

## REFERENCES

- [1] Finegold, J.A., Asaria, P., Francis, D.P. (2013). Mortality from ischemic heart disease by country, region, and age: Statistics from World Health Organization and United Nations. *International Journal of Cardiology*, 168: 934-945.
- [2] Theobald, K., Worrall-Carter, L., McMurray, A. (2005). Psychosocial issues facilitating recovery post-

- CABG surgery. *Australian Critical Care*, 18(2): 76-85.
- [3] Abdelhafiz, A.H.(2013). Epidemiology of Heart Disease in Cardiovascular Disease and Health in the Older Patient. Fifth edition, UK: John Wiley and Sons.
- [4] Gobwald, A., Schienkiewitz, A., Nowossadeck, E., Busch, M.A. (2013). Prevalence of myocardial infarction and coronary heart disease in adults aged 40- 79 years in Germany. *Springer-Verlag Berlin Heidelberg*. 56: 650-655.
- [5] Semolina, K., Wright, F.L., Rayner, M., Goldacre, M.J. (2012). Determination of the decline in mortality from acute myocardial infarction in England between 2002 and 2010: linked national database study. *BMJ*. 344: 8059.
- [6] Schmidt, M., Jacobsen, J.B., Lash, T.L. (2012). 25 year trends in first time hospitalization for acute myocardial infarction, subsequent short and long term mortality, and the prognostic impact of sex and comorbidity: a danish nationwide cohort study. *BMJ*. 344: 356.
- [7] Nicholson, A., Kuper, H., Hemingway, H. (2006). Depression as an aetiologic and prognostic factor in coronary heart disease: a meta-analysis of 6362 events among 146538 participants in 54 observational studies. *European Heart Journal*. 27: 2763-2774.
- [8] Khayyam-Nekouei, Z., Neshatdoost, H., Yousefy, A., Sadeghi, M., Manshaee, GH.(2013). Psychological factors and coronary heart disease. *ARYA Atheroscler*, 9(1): 102-111.
- [9] Pelle, A.J., Denollet, J., Zwisler, A.D., Pedersen, S.S. (2009). Overlap and distinctiveness of psychological risk factors in patients with ischemic heart disease and chronic heart failure: are we there yet? *Journal of affective disorders*; 113: 150-156.
- [10] Ilic, S., Apostolovic, S.(2002). Psychological Aspects of Cardiovascular Disease. *Medicine and Biology*,9(2): 138-141.
- [11] Van Gestel, Y.R.B.M., Pedersen, S.S., Van de Sande, M., Jaegere, P.P.T.D., Serruys, P.W., Erdman, R.A.M., Domburg, R.T.V.(2007). Type- D personality and depressive symptoms predict anxiety 12 months post-percutaneous coronary intervention, *Journal of Affective Disorders*. 103: 197-203.

- [12] Monirpoor, N., Besharat, M.A., Khoosfi, H., Karimi, Y.(2012) The role of illness perception in predicting post-CHD depression in patients under CABG and PCI. *Social and Behavioral sciences*, 32, 74-78.
- [13] Huang, C.J., Chiu, H.C., Lee, M.H., Wang, S.Y. (2011). Prevalence and incidence of anxiety disorders in diabetic patients: a national population- based cohort study. *General Hospital Psychiatry*. 33: 8-15.
- [14] Hsu, Y.M., Su, L.T., Chang, H.M., Sung, F.C., Lyu, S.Y., Chen, P.C. (2012). Diabetes mellitus and risk of subsequent depression: a longitudinal study. *International Journal of Nursing Studies*. 49: 437-444.
- [15] Camara, A., Balde, N.M., Enoru, S., Bangoura, J.S., Sobngwi, E., Bonnet, F. (2014). Prevalence of anxiety and depression among diabetic African patients in Guinea: Association with HbA1c levels. *Diabetes and Metabolism*.....
- [16] Ernst, C.R. (2012). Winter depression and diabetes. *Critical Care Nursing*. 24: 509-518.
- [17] Giansanti, R., Rabini, R.A., Romagnoli, F., Fumelli, D., Sorichetti, P., Boemi, M., Fumelli, P. (1999). Coronary heart disease, type 2 diabetes mellitus and cardiovascular disease risk factors: a study on a middle-aged and elderly population. *Gerontology and Geriatrics*. 29: 175-182.
- [18] Vasiliadis, I., Kolovou, G., Mavrogeni, S., Nair, D.R., Mikhailidis, D.P. (2014). Sudden cardiac death and diabetes mellitus. *Journal of Diabetes and Its Complication*, 28: 573-579.
- [19] Aronson, D., Edelman, E. (2014). Coronary artery disease and diabetes mellitus. *Cardiology clin*.
- [20] Fang, J.C., Teresa, D., Givertz, M.M., Borlaug, B.A., Lewis, G.D., Rame, J.E., Gomberg-Maitland, M., Murali, S., Frantz, R.P., McGlothlin, D., Horn, E.M., Benza, R.L. (2012). World Health organization pulmonary hypertension group 2: pulmonary hypertension due to left heart disease in the adult- a summary statement from the pulmonary hypertension council of the international society for heart and lung transplantation. *The Journal of Heart and Lung Transplantation*. 31: 913-933.

- [21] Scuteri, A., Spazzafumo, L., Cipriani, L., Gianni, W., Corsonello, A., Cravello, L., Repetto, L., Bustacchini, S., Lattanzio, F., Sebastiani, M. (2011). Depression, hypertension, and comorbidity: Disentangling their specific effect on disability and cognitive impairment in older subjects. *Gerontology and Geriatrics*. 52: 253-257.
- [22] Spinar, J. (2012). Hypertension and ischemic heart disease. *Coret vasa*. 54: 433-438.
- [23] Elis, A., Chodick, G., Heymann, A.D., Kokia, E., Flash, S., Lishner, M., Shalev, V. (2011). The achievement of target cholesterol level differs between coronary heart disease and diabetic patients. *European Journal of Internal Medicine*. 22: 262-265.
- [24] Vanhoof, J.M.M., Delcroix, M., Vandevelde, E., Denhaerynck, K., Wuyts, W., Belge, C., Dobbels, F. (2014). Emotional symptoms and quality of life in patients with pulmonary arterial hypertension. *Heart and Lung*, 1-9.
- [25] White, J., Hopkins, R.O., Glissmeyer, E.W., Kitterman, N., Elliott, C.G. (2006). Cognitive, emotional, and quality of life outcomes in patients with pulmonary arterial hypertension. *Respiration research*. 7: 55.
- [26] Johannessen, L., Strudsholm, U., Foldager, L., Munk-Jorgensen, P. (2006). Increased risk of hypertension in patients with bipolar disorder and patients with anxiety compared to background population and patients with schizophrenia. *Journal of Affective Disorders*. 95: 13-17.
- [27] Lovibond, F., Lovibond, S.H.(1995).The structure of negative emotional states. *Behavior Research Therapy*, 33(3): 335-343.
- [28] Maleki A, Asghari MJ, Salari R.(2005). Credit terms of scale,depression, anxietyVastrs DASS-21 in the Iranian population. *J Iran Psychol.*, 1(4): 9-12.