Statistical Analysis of Dispositional and Psychological Factors and their Association with Cardiovascular Diseases

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Abstract

This study aims to explore the effects of dispositional and psychological factors on cardiovascular diseases (CVD) such as personality type 'A' and type 'B', pessimism, optimism, anxiety, depression and stress in the cardiac patients. Overall 292 adult patients (132 males, and 160 females, 133 from private sector and 159 from public sector job holders) were approached in Chaudhry Pervaiz Elahi Institute of Cardiology Multan, Pakistan for survey and Pearson correlation also independent sample t-test was performed to test the objectives of the present study. The results indicate that all the variables are significantly correlated with each other as well as clearly signify the effect of gender and job sector on above-said variables. The findings also reveal that the level of personality type "A", pessimism, depression, anxiety and stress are higher in females and private job holders therefore more indispose to suffering with cardiovascular diseases, where as the level of personality type "B" and optimism are higher in male patients and public job sectors holders. Type 'A' personality is more prone to cardiovascular diseases (CVD), due to its patron of behavior. Moreover, type and nature of job and level of satisfaction also considered as vital as a type of personality in regarding cardiovascular diseases (CVD). Certainly, workplace and environment exert and impact either positive or negative upon the health of an individual.

Keywords: Cardiovascular Disease (CVD), Personality Traits, Pessimism, Optimism, Anxiety, Depression and Stress

Introduction

Cardiovascular diseases are a grave threat to the mankind without any distinction of space and race. Though it's more common among the third world and densely populated areas accompanied with low socioeconomic infra structure. It is reported by the world health organization in 2009 that approximately 82% death among developing countries is due to CVD (Geneva, 2009; WHO, 2009). Numerous dispositional factors may also trigger the heart ailments. Each and every individual has his own personality's traits and types(Kim, Smith, & Kubzansky, 2014; Lee et al., 2014). Type 'A' personality equipped with traits like as autocratic, urgency, aggression, impatience, authoritative, highly emotive, arrogant, rigid and competitive manners and behavior. Such types of persons were ever caught in hypertension disorder ultimately paved a way to CVD (Cooper & Marshall, 2013; Espnes & Byrne, 2016). This type of personality pattern indicates that the highly developed countries have not been barred from CVD. Because such type of behavior pattern including the race for achievement, progress and success are highly common in the west. So, it can be quoted that CVD has no borders.

Numerous researchers indicate a correlation between heart ailments and life style accompanied by traits of type A personality (BekkeHansen, Weinman, Thastum, Thygesen, & Zachariae, 2014; Compare & Zarbo, 2016). These types of traits were considered ill, Injurious and negative for both mind and body. Prevalence of CVD is more common among such type of personality. Indulgence in organizational politics is also a want of type 'A' personality, which may prone the person to the cardiac ailments. Actually, organizational politics considered unofficial malafide thinking to obtain certain legal or illegal incentives(Kelpis et al., 2013; Sridhar, Morrison, & Piot, 2011).

Other factors including stress, hopelessness, hostility, helplessness depression and pessimistic approach accelerate the risk of CVD. Dr Seligman states that above said factor play a havoc role to render an individual to the cardiac ailment. Pessimism evolves irrational myth and believes about CVD (Giardini et al., 2017; Seligman, 2010). These myths ever hinder the population to under gone the treatment including percutaneous coronary intervention (PCI). Research indicates a correlation between the low level of pessimism and reduced prevalence and incidence of heart stroke. Pessimism surely induced stress full condition which further indisposes to hypertension and other cardiac issues. Furthermore, type 'D' personality termed as distress personality gas a stern interlinked with CVD (Durand et al., 2017; Ginting, van de Ven, Becker, & Näring, 2016).

Distress makes a person indecisive and apprehensive easily caught in psychological disorder including anxiety, stress and depression, which are generally considered as major dispositional factors to CVD. Apprehension, fear, phobia, PSTD, accelerates the anxiety (DuBois et al., 2015; Staniute et al., 2015). An elevated level of anxiety, depression, stress disorder predisposes to hypertension and other cardiac disorder including angina, myocardial infarction, ischemic heart diseases and cardiovascular diseases (Pollock, Chen, Harville, & Bazzano, 2017). Because all these factors interfere person's ability as well as reasoning, cognition and decision making. Due to irrational myth and lack of information about the health education an individual will become incapable to overcome these psychological disorders (Barlow, Allen, & Choate, 2016).

A number of studies evolve that stressful condition including social isolation; lack of social support, depression, anxiety, job behavior and especially type 'A' personality, may cause a disturbance between the physical and mental health including the insurgency in the bodily hormone including the adrenal and cortisol to increase the blood pressure, tachycardia, muscular tension. Anxiety increases the incidence of CHD especially among women (Barlow et al., 2016; Bartrop, Buckley & Tofler, 2016; Pedersen, von Känel, Tully, & Denollet, 2017). A lot of studies evident correlation between stress, anxiety, and CHD. Depression one of the major psychological disorders is also a grave risk for the CHD (Greenman, Jette, Green-Demers, & Grenier, 2015). Prevalence of depression is higher in the cardiac patients. It increases the blood pressure, which may lead to atherosclerosis and arteriosclerosis one of the major cause angina, myocardial infarction and other heart ailments. There might be a correlation between the major depression levels increased the risk for CVD, CHD, MI, and CAD(Taylor-Clift et al., 2016). Long lasting depression play a negative havoc influence on the mental and physical health especially to the cardio vascular system (CVS) causing various complex heart issues. Depressive behavior and physiological disturbance trigger the high risk of CVD and CHD.

Depression and panic disorder is of high level among cardiac patients. Depression alone is said a greater predictor of heart ailments. Type 'B' pattern of behavior of personality often encompasses in depression, slow participation, lack of interest, mal functioning behavior often predispose to different cardiovascular diseases. It is necessary to curtail the anxiety, depression, stress level among the heart patient(Carney et al., 2016).These factors play a vital role in behavioral

and emotional distress that may cause cardiovascular disease. This study investigated not only the leading factors involving major cause with cardiovascular disease, it also discusses the precautionary guidelines for the patients of cardiovascular disease(Pedersen et al., 2017).

Objectives of the study
- To identify the role of dispositional factors among cardio vascular disease.
- To explore the personality types A/B and gender differences among the cardiac patients.
- To explore the level of, anxiety stress and depression among the cardiac patients.

Hypothesis
- Depression, Anxiety, Stress will negatively associate with personality type B, Optimism, whereas Type A and Pessimism will positively correlate with Depression, Anxiety and Stress.
- The female patients will have higher level of Anxiety, Depression, Stress but lower level of type B and Optimism as compared to male patients.
- The patients working in public sector perceive low level of Anxiety, Depression, Stress, type A and Pessimism as compare to patients from private sector.

Methodology
The study exploring the *Psychological and Dispositional* factors involved in cardiovascular disease, conducted on a sample of 292 (160 female and 132 male, public and private job sector) patients were conducted by purposive sampling technique from Chaudhry Pervaiz Elahi Institute of Cardiology, Multan, southern Punjab, Pakistan during the period of January 2017 to August 2017. Gender and job sector of the patients were also observed. A 42 items scale used to measure depression, anxiety, and stress.

Table 1: Baseline Characteristics and Risk Factors

Individual factors	Mean	Standard Deviation	Frequency	
Gender	---	---	Male	132
	---	---	Female	160
Job Sector	---	---	Public	159
	---	---	Private	133
Dispositional Risk Factors				
Type A personality	2.55	1.1	---	---
Type B personality	2.46	1.1	---	---
Optimism	6.07	2.51	---	---
Pessimism	6.15	2.52	---	---
Psychological Factors				
Depression	20.73	4.24	---	---
Anxiety	20.85	3.87	---	---
Stress	21.10	4.12	---	---

Research Instruments

DASS 42 is a self-report questionnaire developed by Fernando Gomezto to measure Depression, Anxiety and Stress. This depression, Anxiety, and Stress Scale rated on 0 to 3, where 0=Never, 1=Sometimes, 2=Often and 3=Almost Always.

The personality types A/B Scale was developed by Dr Meyer Friedman and Ray Rosenman. Comprising 10 items with 2-point rating scale, responses are recorded 0 and 1, "0" for "No" and "1" for "Yes".

Life orientation test revised (LOT-R) designed by Scheier, MLR, Carver C.S., and Bridges, M W. to measure the optimism and pessimism level in cardiac patients, the respondents give their responses 0 to 4, where 0= strongly disagree, 1 = disagree, 2 = neutral, 3 =agree, and 4 = strongly agree

Statistical Procedures

Once the data collected then it entered at SPSS v.21 statistical software package (IBM, Armonk, NY) was used to analyze the data. For descriptive analysis mean and standard deviations are calculated for personality type A, personality type B, optimism, pessimism, depression, anxiety and stress. To calculate the relationship between all the variables the Pearson correlation coefficients method used. Comparisons between genders for each of the variables of personality type A, personality type B, optimism, pessimism, depression, anxiety, and stress were calculated via an independent samples *t*-test with corrections made for assumed variance equality. The same procedure was adopted to determine differences between participants who belong to public job sector and private job sectors. The significance level was set at 0.05 for all tests.

Results

To calculate the correlation between depression, anxiety, stress, personality type B, optimism, and pessimism, we applied Pearson correlation method.

Table 2. Relationship of Myocardial Ischemia with Dispositional, Organizational, and Psychological factors (n=292)

Scales	Type-A	Type-B	PESS	OPT	DEP	ANX	STR
Type-A	1.00	-.97**	.97**	-.95**	.31**	.32**	.37**
Type-B	-	1.00	-.96**	.95**	-.33**	-.33**	-.37**
PESS	-	-	1.00	-.99**	.35**	.34**	.40**
OPT	-	-	-	1.00	-.32**	-.31**	-.39**
DEP	-	-	-	-	1.00	.49**	.51**
ANX	-	-	-	-	-	1.00	.54**
STR	-	-	-	-	-	-	1.00

**p< 0.01,   PESS= Pessimism, OPT= Optimism, DEP= Depression, ANX= Anxiety, and STR= Stress

Demonstrates that personality type A is negatively correlated with personality type B and optimism, also positively correlated with pessimism, depression, anxiety, and stress. Whereas personality type B is positively correlated with optimism also negatively correlated with pessimism, depression, anxiety and stress. Similarly, pessimism is negatively correlated with depression anxiety and stress. It has also shown in the table that depression, anxiety and stress are positively correlated with each other.

The independent samples t-test applied to analyze the levels of personality type A,

personality type B, optimism, pessimism, depression, anxiety and stress in male and females patients with cardiovascular diseases. The results are given in below table 3 and table 4.

Table 3. Gender-based differences among Dispositional Factors

	Males (n=132)		Females (n=160)			
	Mean	Standard Deviation	Mean	Standard Deviation	T	P
Type A	2.4	4.4	2.7	5.5	-2.2	.03*
Type B	2.6	1.0	2.3	1.1	2.6	.01*
Optimism	6.4	2.5	5.8	2.5	2.2	.03*
Pessimism	5.8	2.5	6.5	2.5	-2.5	.01*

df = 290, *p< 0.05, **p< 0.01

Table 3 indicates significant gender differences among dispositional factors (type A, type B, optimism, and pessimism). From p-values given in table, we concluded that the male patients reported higher level of personality type B and optimism as compared to female patients while female patients reported a higher level of personality type A and pessimism.

Table 4. Gender-based differences in Psychological Factors

	Males (n=132)		Females (n=160)			
	Mean	Standard Deviation	Mean	Standard Deviation	T	P
DEP	20.07	3.89	21.28	4.44	-2.44	.008**
ANX	19.95	3.58	21.59	3.95	-3.69	.000***
STR	20.62	3.90	21.50	4.27	-1.82	.035*

df = 290, *p< 0.05,**p< 0.01, ***p< 0.001 DEP= Depression, ANX= Anxiety, and STR= Stress

Table 4 explores significant gender differences in psychological factors. Since the p-value for anxiety is 0.000 which indicated that the female patients reported the strongly higher level of anxiety as compared to male patients. Also the levels of depression and stress reported significantly higher in female patients than that of male patients.

For the comparison in levels of personality type A, personality type B, optimism, pessimism, depression, anxiety and stress between patients belongs to public job sector an private job sector with cardiovascular diseases the independent samples t-test applied. The results are given in below table 5 and table 6.

Table 5. Job Sector differences among Dispositional Factors

	Public Sector (n=159)		Private Sector (n=133)			
	Mean	Standard Deviation	Mean	Standard Deviation	T	P
Type A	2.4	1.2	2.7	1.0	-2.8	.006**
Type B	2.6	1.2	2.3	1.0	2.9	.004**
Optimism	6.4	2.7	5.6	2.2	2.8	.005**
Pessimism	5.8	2.7	6.6	2.3	-2.9	.003**

df = 290, *p< 0.05, **p< 0.01

Table 5 signifies differences of dispositional factors (personality type A, personality type B, optimism, and pessimism) among various job sectors. The p-values given in the above table indicated that the patients from private job sector reported higher pessimistic and type A as compared to patients from public job sector and patients have lower optimism and type B working in private job sector as compared to patients working in public job sector.

Table 6. Job Sector wise differences among Psychological Factors

	Public Sector		Private Sector			
	(*n*=159)		(*n*=133)			
	Mean	Standard Deviation	Mean	Standard Deviation	*T*	*P*
DEP	19.79	4.12	21.86	4.11	-4.28	.000***
STR	20.11	3.61	21.72	3.99	-3.61	.000***
ANX	20.20	3.88	22.18	4.16	-4.20	.000***

df = 290, ***$p < 0.001$, DEP= Depression, ANX= Anxiety, and STR= Stress

Table 6 indicates the significant differences in psychological factors (depression, anxiety and stress) among different job sector. From the results and p-value given in the Table 6, we concluded that the patients working in public sector reported a lower level of depression, anxiety and stress as compared to patients from private job sector.

Discussion

The study conducted to examine the dispositional, organizational, and psychological factors among the patients of CVD. The focus of the study was to measure the dispositional, organizational, and psychological factors, like as type A, and type B personality, depression, anxiety, and stress, optimism, and pessimism, in the patients, who visited CPEIC Multan, Pakistan. It has been observed that type A prone to CVD, whereas type B not. Pessimistic personalities found a higher rate of CAD's as compares to optimistic personalities. The study is evidence that anxiety, stress and depression are the major etiological factors of cardiovascular diseases vary with respect to gender.

On the basis of these objectives of the study, the researchers concluded that the depression, anxiety, and stress are significantly negative correlate with personality type B, optimism, while type A and pessimism are significantly positively correlated with depression, anxiety, and stress. As result shown in Table 2 support this hypothesis that depression, anxiety and stress the major causative factors of CVD are negatively correlated with type B, optimism. So, it's concluded that type B, optimism is the low risk factor as compared the high-risk factors depression, anxiety, stress, type A and pessimism in the cardiovascular disease. It implies that the depression, anxiety, stress, pessimism, and type A behavior are prone to the CVD.

The significant difference of predisposition factor among the personality types A & B in respect of optimism and pessimism. The study shows that type B personality being equipped with high level of optimism and reduced level of pessimism has low risk to the CVD

Employees of the private sector generally caught in certain psychological elements due to unsatisfactory infrastructure very low salaries and arrogant behavior of administration. These employees show a high level of pessimism with reduced optimism, increased the level of depression anxiety, stress. Type A personality more prone to coronary artery diseases, as compared to personality type B accompanied with increase optimism, low level of pessimism has minimum indisposition to CAD.

Limitations
- The size of the sample was too short. It should be enlarged.
- The researcher had to face great difficulty to collect the data to institutional and patient non-cooperative behavior due to irrational and myth believes about the heart ailments.

Suggestions
1. The researcher not only took type A & B personality traits but other personality traits like as type C & D should be taken for better evaluation in case of CVD.
2. Behavior modification techniques should be inline regarding the type A personalities to avoid the CAD.
3. There is dire need to launch awareness about the heart ailments to curtail dispositional, organizational and psychological factor to reduce the incidence of IHD, CAD and CVD.

Conclusions
To sum up, taking into account the results of the study it's might be concluded that the depositional and psychological factors all significantly correlated with each other, as well as high level of personality type "A" and pessimism in the females, due to its critical patron of behavior more prone to CVD. Whereas the males with personality type "B", highly hostile in nature with increase level of optimism less prone to CVD. Moreover, the type and nature of job and level of satisfaction also considered as vital as a type of personality in regarding CVD. Certainly, workplace and environment exert and impact either positive or negative upon the health of an individual, if the work load or pressure is high and painful equipped with dissatisfaction, it is dead sure that the health of the employee will be deteriorated. A significant individual's psychosocial anomalies definitely prone an individual to the cardiovascular diseases as it has been concluded in the worthy current study.

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