

Personality Factor as a Predictor of Depression Score Among Depressed and CHD Patients

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ABSTRACT

Introduction: Many risk factors can affect depression and coronary disease, these including physiological and psychological risk factors (such as personality traits)

Objectives: Our objectives were to examine whether personality factors (The Five-Factor Model) can predict depression score in the depressed and coronary heart disease (CHD) individuals compared to that of healthy subjects.

Materials and Methods: To achieve the above objectives, 100 depressed (Mean=35.90 years, SD=10.59 years), and 100 CHD (Mean=46.42 years, SD=12.52 years), patients and 100 healthy subjects (Mean = 37.97 years, SD =12.49 years) were selected by convenience sampling method. To compare the three groups of participants, ANOVA test was used. Stepwise Multiple Regression Analysis was used to identify the variables that most closely predict the perceived stress and depression scores. Pearson's Correlation Co-efficient was used to examine the correlation between variables.

Results: In Neuroticism, the CHD patients had significant highest scores, followed by depressed patients. The healthy group had the least scores. In case of Extraversion, Openness and Agreeableness, healthy participants had significant higher scores followed by the depressed and CHD patients. Only in conscientiousness factor, Depressive and CHD groups had statistically less scores compared to the healthy group. Also, high Neuroticism and Age, and low Extraversion were significant protective factors for depression Scores of CHD patients, while high Neuroticism and low Extraversion function as predictors in the depressed and healthy groups.

Conclusion: The effects of Neuroticism and Extraversion on depression have been reported as inconsistent across previous studies. This study indicates that, older CHD individuals with high Neuroticism and low Extraversion scores are more vulnerable for depression.

Keywords: Agreeableness, Conscientiousness, Coronary heart disease, Extraversion, Neuroticism, Openness

INTRODUCTION

Many risk factors can affect depression and coronary disease, these including physiological and psychological risk factors (such as personality traits) [1,2]. The role of personality traits in particular combination of traits that is claimed to be comprehensive were named as "Five factor" model that includes openness, conscientiousness, extraversion, agreeableness and neuroticism [3].

Depression has been reported to be associated with an increased risk of myocardial infarction and other cardiac events such as the risk of coronary heart disease (CHD) that increases fourfold in depressed people [1]. Psychiatric patients with depression have also been found to have higher rate of myocardial infarction than those without depression [4]. Also, it has been reported that 33 to 50 percent of patients who expile due to an initial myocardial infarction have been significantly depressed prior to the incidence of myocardial infarction [5]. Moreover, depression is associated with increasing risk of mortality in patients with a recent myocardial infarction [6]. The prevalence estimates for clinical depression in past myocardial infarction patients have been reported to be between 20 and 30 percent [7,8]. These patients experience not only the suffering and despair associated with clinical depression but are also at high risk for further morbidity and mortality due to their heart disease [9].

The main focus of this study was investigation of the psychological personality traits as a predictor for depression score among depressive and coronary disease groups compared to the healthy group.

MATERIALS AND METHODS

Design: The study design was quasi-experimental. A correlation method was required in order to investigate the relationship between personality factors and coping behaviours. The participants were selected by convenience sampling, they included 100 cases of CHD (based on cardiologist diagnosis in medical record) from cardiac unit which were selected from Bhaskar's Heart Care Centre and Vikram Hospitals in Mysore city (age: Mean=46.42 years SD=12.52 years); The depressive patients were selected from Psychiatry Out-patient Department of JSS and KR Hospitals in Mysore city (age: Mean= 35.90 years SD= 10.59 years). The healthy subjects (n=100) were drawn from general population, after screening for possible physical or psychiatric morbidity (age: Mean = 37.97 years; SD =12.49 years).

Inclusion criteria: Those diagnosed as suffering from depressive disorder based on ICD-10 [10], by psychiatrist and William WK Zung Self-Rating Depression Scale.

Only those patients who had cardiac disease, usually more than one test will be done before a definite diagnosis can be made. Some tests for approving of diagnosis include: Electrocardiogram (ECG), Exercise Stress Test, Echocardiogram, Nuclear Scan, Coronary angiography and Electron-beam computed tomography (EBCT). A group of healthy people were drawn from the normal volunteers of the city. The General Health Questionnaire was administered to determine the presence of any physical and mental problems. The cutoff point of G.H.Q-28 score for screening the healthy from unhealthy people was less than 23. Only those individuals who had scores below 23 were included in the study [11].

Exclusion criteria: For coronary heart patients those patients with history of smoking, family history of heart disease, history of any other, physical or mental illnesses were excluded. For depression, there should never have been a manic episode, a mixed episode, or a hypomanic episode or due to the direct physiological effects of a general medical. However, patients with history of smoking, alcohol consumption, family history of depression, history of heart diseases, and history of any other physical or mental illnesses were excluded terms. The personality factors were assessed by the NEO-FFI [12] that is a 60 items scale with 5 factors, each factor containing 12 items. The NEO-FFI [12] was used as an assessment of five traits because it was considered an extremely reliable and cross-culturally valid measure of personality traits [13]. The dispositional version of COPE [14] was chosen to measure coping strategies, as opposed to the situational version, because the latter has recently been criticized on its methodology and psychometric validity [15].

STATISTICAL ANALYSIS

To compare the three groups of subjects and to identify the variables that most closely predict the perceived stress and depression scores, the ANOVA test and Stepwise Multiple Regression Analysis were used. Pearson's Correlation Coefficient was used to examine the correlation between variables. In case of ethical issues, we considered Helsinki & Belmont ethical statements.

RESULTS

The results of ANOVA in [Table/Fig-1] shows significant differences between the groups in five factors of personality factors (Neuroticism, Extraversion, Openness, Agreeableness and Conscientiousness). Then the factors were compared by multiple comparison tests (Scheffe) to examine the differences of means among the three groups separately.

According to [Table/Fig-2], it is concluded that each group is different from another significantly and had statistically equal scores only in conscientiousness factors in Depressed and CHD groups compared to the healthy group. In Neuroticism, CHD patients had significantly highest scores, followed by depressed patients and healthy group which had the least ones. In Extraversion, Openness and Agreeableness factors healthy subjects had significantly higher scores, followed by the depressed patients and that the CHD patients had the least score.

Considering the role of Personality Five-Factors as a predictor of the Zung Depression Score for the depressed, coronary heart disease (CHD) patients, and the healthy group, the depression score was taken as the dependent variable; the other ones were entered as independent variables in a multiple regression analysis. The results were shown among the depressed patients. For the depressed group, the following independent variables (included Openness, Extraversion and Neuroticism) had significantly contributed for the prediction of depression score [Table/Fig-3], for the CHD subjects, the three independents variables included Extraversion, Age and Neuroticism which had significantly contributed for the prediction of depression score [Table/Fig-4]. For the healthy people, two personality factors (included high Neuroticism, and low Extroversion) which had significantly contributed for the prediction of depression score [Table/Fig-5].

Variables	Groups	n	Subset for alpha=. 01		
			1	2	3
Neuroticism	Healthy group	100	21.27	-	-
	Depressive group	100	-	26.86	-
	C H D group	100	-	-	28.42
	Sig.		1.000	1.000	1.000
Extraversion	C H D group	100	20.09	-	-
	Depressive group	100	-	23.26	-
	Healthy group	100	-	-	28.02
	Sig.		1.000	1.000	1.000
Openness	C H D group	100	21.48	-	-
	Depressive group	100	-	23.84	-
	Healthy group	100	-	-	26.11
	Sig.		1.000	1.000	1.000
Agreeableness	C H D group	100	21.17	-	-
	Depressive group	100	-	23.32	26.10
	Healthy group	100	-	-	-
	Sig.		1.000	1.000	1.000
Consciousness	C H D group	100	22.65	-	-
	Depressive group	100	22.83	-	-
	Healthy group	100	-	26.20	-
	Sig.		.927	1.000	-

[Table/Fig-2]: Means of groups for subscales of coping resources (personality Five-Factors) (Scheffee)
Means of groups in homogeneous subsets are displayed
100.000 was the considered harmonic mean sample size

Model	Predictive variable	R	R Square	F	P	Standardized Beta
1	Openness	.268 ^a	.072	7.608	.016	-.226
2	Extraversion	.369 ^b	.136	7.665	.002	-.293
3	Neuroticism	.446 ^c	.199	7.961	.007	.255

[Table/Fig-3]: Prediction of Depression as function of the five personality factors for depressive group
^a. Predictors: (Constant), Neuroticism
^b. Predictors: (Constant), Openness, Life Events
^c. Predictors: (Constant), Openness, Neuroticism

Model	Predictive variable	R	R Square	F	P	Standardized Beta
1	Extraversion	.412 ^a	.170	20.018	.004	-.288
2	Age	.470 ^b	.170	13.764	.024	.212
3	Neuroticism	.503 ^c	.253	10.846	.045	.192

[Table/Fig-4]: Prediction of Depression as function of five personality factor for CHD group
^a. Predictors: (Constant), Extraversion
^b. Predictors: (Constant), Extraversion, Age
^c. Predictors: (Constant), Extraversion, Age, Neuroticism

Factor/Subscale	Groups			f- value	p-value
	Depressive	CHD	Healthy		
	Mean ± S.D	Mean ± S.D	Mean ± S.D		
Neuroticism	26.80 ± 4.49	28.420 ± 3.64	21.27 ± 3.56	91.854	0.01
Extroversion	23.26 ± 3.78	20.09 ± 3.97	28.02 ± 4.52	94.42	0.02
Openness	23.84 ± 3.73	21.48± 3.73	26.11 ± 3.42	41.64	0.04
Agreeableness	23.32 ± 3.08	21.17 ± 3.35	26.10 ± 3.24	57.47	0.01
Consciousness	22.65 ± 4.08	22.83 ± 5.13	29.20 ± 6.46	49.24	0.03

[Table/Fig-1]: Descriptive statistics and results of One-Way ANOVA for mean scores on various sub- factors of coping resources for different groups

Model	Predictive variable	R	R Square	F	p	Standardized Beta
1	Neuroticism	.432 ^a	.186	22.461	.000	-.341
2	Extroversion	.502 ^b	.252	16.322	.004	.271

[Table/Fig-5]: Prediction of Depression as function of five personality factor for Healthy group

^a. Predictors: (Constant), Neuroticism

^b. Predictors: (Constant), Extroversion

DISCUSSION

One of the negative personality traits is neuroticism [16]. The neuroticism trait reflects the tendency to experience emotional distress and the inability to cope with stress effectively. Highly nervous people are more vulnerable to show tension, anxiety, insecurity, suspicion, jealousy, emotional instability, hostile behaviour [17,18]. Although emotional distress is associated with psychosomatic complaints such as chest pain in the absence of CHD [18], as well, evidences suggest that emotional distress is associated with actual CHD [19,20].

In Neuroticism, CHD patients had significantly highest scores, followed by depressive patients and healthy group who had the least scores.

McWilliams L and Willis-Owen SAG et al., quoted from Duggan et al., Roberts & Kendler Neuroticism, defined as a general vulnerability to neurotic breakdown under stress, is a heritable personality trait and has been positively associated with depression [21,22].

In case of neuroticism the integrated model was established by Clark and Watson (1994) based on the data about neuroticism, extraversion and depression in a tripartite model of the relationship between personality and the distress disorders. Their model classifies anxiety and depressive symptoms into three subtypes including nonspecific symptoms of general distress (related to neuroticism); depression-specific symptoms of anhedonia, low energy, and low positive affect (related to low extraversion); and relatively anxiety-specific symptoms of somatic or autonomic arousal [23,24].

Individuals with low levels of neuroticism are much less sensitive to the depressogenic effects of adversity than those with high levels of neuroticism. Former A had verified these results in their additive model, where they detected highly significant positive interactions among neuroticism, extraversion and stressful life events in the prediction of risk of depressive onset [25]. However, the relationship between neuroticism and depression is complicated. Genes that pre dispose to mood disorders overlap with those implicated in neuroticism [26] and individuals with high levels of neuroticism are more likely to experience depression after stressful life events than those with low levels of neuroticism [25]. Furthermore, evidence is emerging for a significant individual–environment interaction, whereby individuals with high neuroticism scores select themselves into high-risk environments and as a result, become more likely to experience stressful life events [27]. For individuals with high levels of neuroticism, a vicious circle is hypothesized in which they are more likely to place themselves in high-risk situations and because of a high genetic loading for depression, are less able to withstand the adverse effects of stressful life events when they occur.

The results of the present study are consistent with findings of several previous researches. Ormel, Oldehinkel, Brilman, showed in their study, that stressful life events predisposed to major depression only in those who had high levels of neuroticism or had a prior long-term difficulty [28]. Of the four prior studies that examined the interrelationship of neuroticism and various measures of "life stress" on self-reported symptoms of depression, anxiety, or distress all showed that subjects with high neuroticism levels were more sensitive than those with low neuroticism levels to the adverse effects of "stress." Coronary heart disease (CHD) risk factors do not entirely explain the risk of CHD events [29]. This has led to an

examination of other putative CHD risk factors, providing more information about history of individuals, their coping resources and life events can create a useful profile, which will be helpful to perform appropriate, timely prevention and treatment interventions or any program to improve mental health, especially for those individuals who are more susceptible to illness.

CONCLUSION

The effects of Neuroticism and Extraversion on depression have been reported as inconsistent across previous studies. This study indicates that, older CHD individuals with high Neuroticism and low Extraversion scores are more vulnerable for depression.

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