

Coronary – Prone Behaviour Pattern, Stressful Life Events, Optimism and Subjective Well-being as Risk Factors for Coronary Heart Disease

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Many studies have provided clear and convincing evidence that psychosocial factors contribute to the causation of coronary heart disease (CHD). Coronary heart disease is associated with a large number of psychosocial factors. The present study was conducted to investigate the role of coronary – prone behaviour pattern, presumptive stressful life events, optimism, and subjective well-being in pathogenesis of coronary heart disease. Coronary Scale (CS), Ercta-A, Presumptive Stressful Life Events Scale, Subjective Well-Being Inventory (SUBI), and Optimism Scale were administered on 118 participants (56 CHD Patients and 62 Healthy Controls). The age ranged between 40 and 80 years. Data were processed for Discriminant Function Analysis and One way Analysis of Variance (ANOVA). Analysis of variance showed that patients with Coronary Heart Disease and the normal group were significantly different in personality type along with perceived ill health. Discriminant Analysis clearly revealed a linear combination of coronary scale and two subpart of subjective well-being i.e. transcendence and social support which account for considerable degree of variation between coronary heart disease and normal controls.

Keywords: Coronary Heart Disease, Stressful Life Events, Behaviour Pattern

Several psychosocial variables have been identified as putative risk factors for coronary heart disease, including stress, emotional disorders, personality traits, depression, and poor social support (Krantz & McCeney, 2002; Kubzansky, Davidson, & Rozanski, 2005). Recent epidemiological studies have confirmed that psychosocial factors are associated with increased risk of developing coronary heart disease (CHD), a major cause of death and disability worldwide (Kuper, Marmot, & Hemingway, 2002; Williams, 2008; Williams, Steptoe, Chambers, & Kooner, 2009). Personality characteristics and behavioural patterns are significantly associated with the higher risk of developing coronary heart disease. Several previous studies have reported personality differences

between patients with coronary heart disease and healthy subjects (Barefoot, Beckham, Peterson, Haney, & Williams, 1992; Byrne, 1996; Denollet, 1996; Sanderman & Ranchor, 1997). The Type-A behaviour pattern (TABP) which is characterized by excessive competitiveness drive, impatience, hostility and vigorous speech characteristics, identified by two Cardiologists Friedman & Rosenman (1959) is widely considered as the major conceptualization of the coronary-prone personality. Another conceptualization of the coronary-prone personality has been provided by Grossarth-Maticek and co-workers. (Grossarth-Maticek et al.1985; Grossarth-Maticek and Eysenck, 1990). They reported findings in support of a predictive role of personality in the onset of

deadly disorder like CHD and cancer. While some prospective studies found that Type-A behavior was associated with the incidence of CHD (Rosenman et al., 1975; Haynes, Feinleib, & Kannel, 1980; Kornitzer, Kittel, De Backer, & Dramaix, 1981), others failed to replicate this association (Barefoot et al., 1989; Matthew & Haynes, 1986; Shekelle, Gale, & Norusis, 1985). Some recent epidemiological studies have reported Type –A Behaviour to be an independent predictor of CHD (Cole, Kawachi, Liu, 2001; Gallacher, Sweetnam, Yarnell, Elwood, & Stansfeld, 2003). On the other hand, some other studies of Type- A behaviour as a risk factor for progression of CHD have produced inconsistent findings (Ikeda et al., 2008; Mitaishvili & Danelia, 2006). The findings of studies on Type -A have been very contradictory.

Stress is also widely believed to be an important determinant of heart disease. People who have had heart attacks named stress as the cause of their disorder (Cameron, Petrie, Ellis, Buick, & Weinman, 2005). Stress can serve as a trigger for heart attacks for people with coronary heart disease (Kop, 2003). Large number of investigations has suggested a role of stressful life events in uncovering an individual's vulnerability to acute CHD (Cottingham, Matthews, Talbott, & Kuller, 1980; Mayou, 1979; Myers & Dwar, 1975; Reich, 1983). "A life event represents a discrete change in an individual's social or personal environment, which should be external and verifiable rather than internal or psychological." Studies conducted with Indian population have shown that stressful life events had occurred more frequently amongst the CHD patients than in normal controls (Singh & Misra, 1987; Singh, Jain, Singh, Gupta, & Kishore, 2003). In order to evaluate risk factors for coronary heart disease, (Rosengren et al., 2004) in the interheart study tested people from 52 countries around the world and reported that

people who had heart attacks also experienced more stressful life events than their matched controls. Recently Rafanelli et al. (2005) studied the role of stressful life events and depressive disorders as risk factors for acute coronary heart disease. Results reported patients with acute coronary heart disease reported significantly more life events than control subjects. In addition to personality type, there are other personal factors that are associated with the higher risk of developing coronary heart disease. One of these factors is the attitude that people have toward the things that happen to them in life. Research on people who have received angioplasty (Helgeson, 2003) indicated that those who had a more positive outlook about themselves and their future were less likely to experience a recurrence of cardiovascular disease. In a comparative study, Giltay (2004), over the follow up period of 9.1 years (1991 to 2001), reported that participants reporting high levels of optimism had a 55 percent lower risk of death from all causes, and a 23 percent lower risk of cardiovascular death and concluded that the trait of optimism was an important long-term determinant of all-cause and cardiovascular mortality in elderly subjects independent of socio-demographic characteristics and cardiovascular risk factors." Recently, Tindle et al. (2009) found that Optimistic women, compared to pessimistic women, had a 9 percent lower risk of developing heart disease and a 14 percent lower risk of dying from any cause after more than eight years of follow-up. Like other psychosocial factors, subjective well-being is also associated significantly with CHD. Rose, Sivik, and Delimar (1994) determined associations between cardiovascular risk factors and subjective experience of psychological general well-being with special reference to gender-related differences. Subjective experience of psychological well-being was significantly correlated with cardiovascular risk factors

among both men and women. There were, however, marked differences between the genders.

Method

Sample:

The present study was conducted on a sample of 56 Coronary Heart Disease (CHD) Patients along with 60 normal controls. Most of CHD patients were inpatients who were hospitalized in ICU for 72 hours, and rest of the sample included outpatients. The age range of the sample was from 40 years to 80 years. The sample consisted of participants from all walks of life. Only those patients were included who gave written consent to participate in the study.

Instruments:

Subjective Well-Being Inventory (SUBI): The SUBI is a 40 items self report measure developed by Nagpal and Sell (1985) to measure feelings of well being or ill being as experienced by an individual or a group of individuals in day to day life of concern. The inventory measures 11 dimensions of subjective well being. However the factor structure of the SUBI has been found showing stability in contents of factors over different Indian samples. The mean score on normal adult Indian samples is 90.8 with a standard deviation of 9.2.

Coronary Scale (COR): It was constructed by Marusic et al. (2002) from EPQ items (Eysenck Personality Questionnaire 1975 version) that measures proneness to coronary heart disease. It contains 8 items: 6 from neuroticism scale, one from defensiveness scale, and one from extraversion scale. It is useful for detecting those who are at higher risk to develop coronary heart disease. Alpha coefficient for the coronary scale was sufficiently high (0.77 for patients with ischemic heart disease and 0.76 for controls).

ERCTA-A Scale: It was a screening instrument for measuring Type-A behaviour Pattern, designed by Sutil and Corbacho (1998) initially developed for Spanish population. It comprises of 8 items with a 5-point response scale. Alpha coefficient of reliability –internal consistency for ERCTA-A is .68.

Presumptive Stressful Life Events Scale (PSLES): It was a stressful life events scale developed by Singh, Kaur, and Kaur (1984) for use with Indian population. It consists of 51 items. It consists of two time scale; (a) life time (b) past one year. PSLES-Life Time scale measures stress level of an individual for stressful events occurred in life-time period and PSLES-Past one year which measures stress level of an individual for stressful events in time period of past one year. The scale is rated according to decrease in severity of perceived stress, however in practice it is recommended that scale should be administered in reverse order.

Optimism Scale: It was taken from Seligman's book, "*Learned Optimism*" (1990). It contains 32 items. It intends to measure a person's explanatory style (a term used by Seligman for the manner learned in childhood and adolescence, in which we explain our setbacks to ourselves) on two dimensions termed as permanence and pervasiveness. Permanence consists subscales permanent good (PmG) and permanence bad (PmB). Pervasiveness also consist two subscale pervasiveness good (PvG) and pervasiveness bad (PvB). Each subscale contains eight items. Hope score can also be obtained by these four subscales.

Results

In order to meet the objectives of the study, the data was subjected to Pearson correlations, one way ANOVA and discriminant analysis. Table 1 shows intercorrelation matrix. The careful inspection

of Table 1 shows that Measures of Optimism Scale are correlated negatively with Measures of Subjective Well-Being. Permanence Good (PvG), a measure of optimism is correlated negatively with Confidence in coping (SWB4), a measure of subjective well being ($r = -.30, p < .05$) which is significant at .05 level. Pervasiveness Bad (PvB) is correlated negatively with General well being –Negative Affect ($r = -.36, p < .01$) that is significant at .01 level of significance. PvB is also correlated negatively with Confidence in coping ($r = -.31, p < .05$), Transcendence ($r = -.33, p < .05$), Primary group concern ($r = -.30, p < .05$) at .05 level of significance indicating that pessimistic people are likely to have feeling of joy, energy, interest in life, their pessimism don't have bad effect on their subjective well being.

However having good confidence in coping, adequate mental mastery and high on their possession of spiritual qualities. Coronary Scale is negatively correlated with measures of Subjective Wellbeing i. e. Primary group concern e. ($r = -.38, p < .01$) inadequate mental mastery ($r = -.43, p < .01$), perceived ill-health ($r = -.35, p < .01$), Deficiency in social contacts ($r = -.35, p < .01$) and General well-being - negative Affect ($r = -.35, p < .01$) which is significant at .01 level of significance. Coronary scale is positively correlated with PmG ($r = .28, p < .05$) which is significant at .05 level of significance. It shows that heart patient those who have neurotic personality traits as emotional liability and instability in emotions have adequate mental mastery, adequate sleep, and good at social contacts and have positive outlook towards life.

ERCTA-A has positive correlation with Expectation - Achievement congruence which is significant at .05 level of significance ($r = .28, p < .05$) which indicates that subjects with Type-A Personality have positive relation with neuroticism dimension of personality. It is also

positively correlated with Cor ($r = .28, p < .05$). It may be interpreted that people with coronary heart disease are having Type-A Behavioural Patterns. Measures of Presumptive Stressful Life Events Scale (PSLES) are correlated negatively with measures of subjective well-being. PSLES-Life time is negatively correlated with Confidence in coping ($r = -.28, p < .05$), Family group support ($r = -.32, p < .05$), Social support ($r = -.28, p < .05$), Primary group concern ($r = -.32 < .05$) which is significant at .05 level of significance. It is also negatively correlated with General well-being-positive affect ($r = -.36, p < .01$) which is significant at .01 level of significance. It indicates that as the life stress increase the confidence in coping decrease. CHD Patients who have faced more stressful life events in their lives for life time period used less coping specially related to problem and showed low mastery over critical conditions. However those who have experienced more stressful life events for whole life time received less family support as well as social support. It indicates that people who have faced more stressful life were not enjoying healthy life. They were not reporting their lives as functioning smoothly and joyfully. Overall perception of their life was not reflecting feelings of well-being.

PSLES-Life time is positively correlated with Pervasiveness Good ($r = .32, p < .05$), Pervasiveness Bad ($r = .32, p < .05$), measures of Optimism. CHD patients those who have been victim of stressful life events for life time period are likely to be pessimistic. PSLES-Past one year is negatively correlated with General well-being - Negative Affect ($r = -.37, p < .01$) indicates that CHD patients those who faced more stressful life events for past one year were reflecting feelings of well-being. And after experiencing stress for short time period, they are reporting their lives functioning smoothly and joyfully.

Table 1. Correlation among measures in CHD patients

	PmG	PvG	PvB	COR	ERCTA	PSLES1	PSLESLT
SWB1	-.30*						-.36**
SWB2							.28*
SWB3				-.31*			-.28*
SWB4		-.30*		-.33*			
SWB5							-.32*
SWB6							-.28*
SWB7				-.30*	-.38**		-.32*
SWB8					-.43**		
SWB9					-.35**		
SWB10				-.36**	-.35**		
SWB11					-.35**		.32*
PmG					.28*		.32*
COR						.28*	.29*

*p< 0.05 **p<0.01

SWB1 = General well-being-positive affect; SWB2 = Expectation-achievement congruence; SWB3 = Confidence in coping; SWB4 = Transcendence; SWB5 = Family group support; SWB6 = Social support, SWB7 = Primary group concern; SWB8 = Inadequate mental mastery; SWB9 = Perceived ill-Health; SWB10 = Deficiency in social contacts; SWB11= General well-being-negative affect; PmG = Permanence good; PvG = Pervasiveness Good; PvB = Pervasiveness Bad; COR = Coronary Scale; ERCTA = ERCTA Scale; PSLES-1 = Presumptive Stressful Life Events Scale-Past one year ; PSLES-LT = Presumptive Stressful Life Events Scale-Life Time.

One-Way Analysis of Variance was applied to find out the differences on measures of Coronary-prone behaviour pattern, Stressful life Events, Optimism and Subjective Well-being among CHD patients and normal controls. It shows that CHD patients and normal controls differ significantly on Coronary scale (F= 11.334, p < .001). They also differ significantly on Perceived-ill health, a variable of subjective well- being (F= 6.275, p < .05)

In order to examine whether a set of certain variables tapping coronary-prone behaviour pattern, presumptive stressful events, type-a behaviour pattern, subjective well being and optimism differentiate between CHD patients and normal group, the data were subjected to Discriminant Analysis. To find the most potent predictors of the group membership, the stepwise method of Discriminant Analysis was employed (Tabachnick & Fidell, 1989). The results of stepwise discriminant analysis indicates that

3 of 22 variables measured in the study contribute significantly to the prediction of group membership i.e. Coronary heart disease patients and normal controls. Among these three variables, the significant difference has been found between CHD patients and normal controls on coronary scale which is significant at .01 level of significance. Another two variables are the components of the subjective well being. The Wilks Lambda coefficient is decreasing with the entry of additional variable up to third step. It is pertinent to mention here that lower Lambda value is an indication of greater discrimination by the variables in equation. If the value of Lambda is exactly 1.00 the variables does not make any differentiation between the groups. The Lambda coefficients at each step are .91, .88, and .84, respectively, for coronary scale, social support, transcendence.

The coronary scale being the major contributor to the group discrimination

entered the equation at step one. The F-value of its discriminant function equals to 11.3(df = 1/116), which is significant at .001 probability. Therefore coronary behaviour pattern may be regarded as most potent discriminant among CHD patients and normal controls. The second important variable with regard to discrimination between the groups is Social Support, which entered in the equation at step two. The F-value of the contribution of this variable in equation is 7.89 (df 2/115) which is significant at .001 probability level. Transcendence entered the equation at step three. It contributes Lambda coefficient of .23 with F-value of being 7.06 (df 3/114), its contribution is also significant at .001 probability level. The efficiency of the three variables entered in the equation is clearly evident from the predicted group membership in CHD patients and normal groups. It is clear from the predicted frequencies given in the Table-2 that out of 56 cases of CHD group, 40 were correctly identified as CHD patients by the discriminant analysis defined by three variables on the same pattern. 42 out of 62 cases in normal group were identified as normal. The percentage of correct identification of cases is about 70% in the overall sample.

Table 2. Predicted Classifications of CHD patients and Normal population

	CHD	Normal	%
CHD	40	20	71.4%
Normal	16	42	67.7%
Total	56	62	69.5%

Discussion

The findings of the present study are revealing and interesting in many respects. The present study was aimed at examining relationship among coronary heart disease, personality traits and psychosocial factors. The data proved that both the groups had significant differences on the variables studied in the present research work.

Patients with Coronary heart disease showed significant differences with normal controls. They showed significant differences on psychosocial variables such as coronary-prone behaviour pattern, subjective well being. One way analysis of variance

Discriminant Functional Analysis found marked difference between CHD patients and normal aspects with regard to subjective well being as well as coronary-prone behaviour pattern. With coronary-prone behaviour difference was found on trait neuroticism. Though no significant difference was revealed between CHD patients and normal controls with regard to Type - A behaviour pattern. Two variables of subjective well being i. e., Social Support and Transcendence have appeared to be the major variables that differentiates between CHD patients and normal ones. Discriminant Functional Analysis has proven very useful in identifying the cluster of variables which differentiate between CHD and normal controls. Like Discriminant Functional Analysis, One way Analysis of Variance found significant differences on Coronary-prone behaviour pattern and Perceived-ill health, a variable of subjective well- being. It can be concluded that coronary-prone behaviour pattern and subjective well-being are the main factors which differentiates between CHD patients and normal controls. In this sense, it provides empirical support to the findings of earlier workers (Denollet, 1998; Rosengren et al. 2004; Westlake & Dracup, 2001).

Earlier prospective studies have revealed a negative correlation between the level of social support and coronary heart disease. Social Integration (SI) is associated with decreased prevalence of myocardial Infarction (MI), angina pectoris (AP), and total coronary heart disease (Reed, McGee, Yano, & Feinleib, 1983). Similarly, individuals who are not well integrated within a network of social ties, or who perceive low levels of social

support, are more likely to experience negative CHD outcomes (Blazer 1982; Welin, Tibblin, & Svardsudd, 1985). Transcendence is described as feelings of subjective well-being derived from values of a spiritual quality. Studies have found that spirituality may play a major role in functioning, health status, and quality of life in heart failure patients because spiritual concerns are important to them and are significant in how they view and cope with their illness (Jones, O'Connell, & Gray, 2003; Westlake & Dracup, 2001). In patients with chronic heart failure, greater spiritual well-being, particularly meaning/peace, was strongly associated with less depression. Enhancement of patients' sense of spiritual well-being might reduce or prevent depression and thus improve quality of life and other outcomes in this population (Bekelman et al., 2007).

The results of the present study clearly evidenced the difference between personality traits of heart patients and normal people which are consistent with previous findings (Byrne, 1996; Denollet, 1998; Sanderman, & Ranchor, 1997) that indicate a very strong association does exist between coronary-prone behaviour pattern, and the prevalence and incidence of coronary heart disease. On the other hand, both groups did not differentiate on Type-A behaviour pattern, consistent with earlier findings (Ikeda, Iso, Kawachi, Inoue, & Tsugane, 2008; Mitaishvili & Danelia, 2006). Both groups did not show differences on Optimism and Presumptive stressful life events.

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