

# THE RELATIONSHIP BETWEEN HOSTILITY AND CORONARY HEART DISEASE IN HIGHLAND AND URBAN POPULATION OF SABAH: A COMPARATIVE STUDY

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## ABSTRACT

*Our study attempted to establish a correlation between living in a conducive environment such as the highland of Crocker Range Sabah with the individual's affective component of hostility and predisposition to coronary heart disease (CHD). Our preliminary survey appeared to suggest that highland individuals with high level of hostility experienced fewer episodes of stress as compared with hostile individuals in the urban area. Each individual interpreted and coped with stress differently. Our result also showed that the ways these two groups of hostile individuals handled their stress differed and urban hostile individuals tended to handle their stress by engaging high-risk health behaviours. Although this finding appeared to suggest that conducive environment and good social support may have a buffering effect on an individual's hostility, further large scale study is needed to confirm this hypothesis.*

## INTRODUCTION

Crocker Range Park is surrounded by many villages of different ethnic communities; primarily the Kadazandusun people. In these highland settings, life generally goes on at a slow pace in a pleasant tranquil environment; relatively hassle-free compared to that of the urban settings. People live in close-knitted families just as other rural communities in Malaysia. In this type of family structure, the level of social support is usually deemed adequate and sustainable. Such living environment coupled with strong social support provided by highly extended family institution, individuals living in these rural communities face no or minimal stress on a daily basis compared to their counterparts in the urban communities. Stress has been shown to inflict many adverse effects on the physical health of man, including its contributory role in coronary heart disease (CHD) (Fuller and Schaller-Ayers 1994). Each individual interprets and copes with stress differently. Slow-paced life, less energy and time demands, and good social support system appear to be an ideal and conducive setting for individuals to cope with stress positively. As hostile individuals are less able to cope with stress, environmental demands can be an added stress and may lead them to cope with whatever stressors negatively. It is hypothesized that conducive environment in the highland has a modulating effect on individual's affective component of hostility and thus lower their risk for CHD. This study aimed to investigate whether conducive environment in the highland of the Crocker Range Sabah has a modulating effect on individual's affective component of hostility and thus lower their risk for CHD.

## METHODS

### Subjects and Methodology

The subjects of this case-control survey consisted of 60 men between 40 and 79 year of age.

The cases were 12 patients hospitalised for CHD. They were admitted to Tambunan and Keningau Hospital during the period of January 1998 till October 1999. There were a total of 35 patients admitted during that period, but only 12 patients were traced. These cases were visited at home. After the purpose and the procedures of the study had been explained, a written informed consent form was signed and the cases were interviewed.

There were two control groups consisted of 48 male adults. The first group was 24 age matched neighbourhood controls who were living in the same community. This group did not have history of CHD. The second control group consisted of 24 age-, religion- and occupation-matched male adults, who were CHD-free and recruited from an urban community in Kuching. The first group of controls was interviewed in their homes while the second group was interviewed when they attended outpatient clinic for treatment.

Both cases and controls were interviewed using the Cook-Medley Hostility Scale. This scale was empirically derived from the Minnesota Multiphasic Personality Inventory which measured cynicism, hostile affect and aggressive responding (Cook and Medley 1954). The subjects' hostile behaviours were observed during interview based on Barefoot's (1992) Interpersonal Hostility Assessment Technique. Subjects' history of cigarette smoking, alcohol consumption and high fat diet consumption was also obtained. In addition, information regarding the numbers of episode of stress experienced per week, and ways of coping with stress was also included in the questionnaires. Although this assessment tool was meant to be self-administered, but for this study, it was assumed that interview would be a more appropriate way to obtain confident result. This assumption was made for two reasons: (1) subjects were from low-educational background and thus might misinterpreted the questionnaires, and (2) the study period was short and questionnaires that were left behind might not receive any response. The data collected were analysed using mean, frequency and percentage distribution. No attempt had been made to carry out other statistical tests because of the small sample size.

## RESULTS

Characteristics of cases and controls 1 (controls from Crocker Range) with regard to age, current smoking, drinking, high cholesterol diet and hypertension are presented in Table 1. Cases and age-matched controls differed with the mean age of cases been 61.3 and controls 57.4. Current smoking, consuming alcohol and eating high cholesterol diet occurred more often in controls than in cases. There is also significant difference between cases and controls in the prevalence of self-reported hypertension.

*Table 1: Characteristics of cases and controls with respect to age, current smoking, drinking, high cholesterol diet and hypertension.*

<b>N</b>	<b>Case (12)</b>	<b>Control 1 (24)</b>
Mean age	61.3	57.4
Current smoking	7 (58.3%)	16 (66.7%)
Current drinking	9 (75.0%)	20 (83.3%)
Current high cholesterol diet	2 (16.7%)	11 (45.8%)
Hypertension	8 (66.7%)	18 (75.0%)

The characteristics of hostile cases and controls (Ho score >20) were compared and the results showed that 75% of cases and controls reported to suffer hypertension and all of them consumed alcohol drinks. Details of the result are depicted in Table 2.

*Table 2: Comparison between high hostile cases and controls (Ho scores >20) with respect to hypertension, smoking, drinking, consuming high cholesterol diet*

<b>N</b>	<b>Case (4)</b>	<b>Control 1 (4)</b>
Hypertension	3 (75%)	3 (75%)
Current smoking	3 (75%)	2 (50%)
Current drinking	4 (100%)	4 (100%)
Current high cholesterol diet	1 (25%)	2 (50%)

Table 3 shows the comparison between high hostile cases and controls (Ho scores >20) with respect to episodes of stress per week, stress coping mechanism by (a) talk to others, (b) drinking more, (c) smoking more, (d) eating more. Cases experienced about three to four times of stress per week whilst controls only experienced occasional stress. Controls managed their stress by confiding with significant others while cases drank more alcohol and smoked more cigarettes in times of stress.

*Table 3: Comparison between high hostile cases and controls 1 (Ho score >20) with respect to episodes of stress per week, stress coping mechanism by (a) talk to others, (b) drinking more, (c) smoking more, (d) eating more*

<b>N</b>	<b>Case (4)</b>	<b>Control 1 (4)</b>
Episode of stress @ 3 to 4 times per week	4 (100%)	0 (0%)
Talk to others	3 (75%)	4 (100%)
Drink more	4 (100%)	0
Smoke more	4 (100%)	0
Eat more	1 (25%)	1 (25%)

The characteristics of highly hostile individuals in group 1(Crocker Range) and group 2 (Kuching) were compared with respect to hypertension, smoking, drinking and consuming high cholesterol diet. The only significant difference is all group 1 controls drink alcohol as opposed to only 33.3% of group 2 controls drink. The results are shown in Table 4.

*Table 4: Comparison between high hostile Controls (1) and controls (2) (Ho score >20) with respect to hypertension, smoking, drinking, consuming high cholesterol diet*

<b>N</b>	<b>Control 1(4)</b>	<b>Control 2(6)</b>
Hypertension	3 (75%)	4 (66.7%)
Current smoking	2 (50%)	5 (83.3%)
Current drinking	4 (100%)	2 (33.3%)
Current high cholesterol diet	2 (50%)	3 (50%)

Highly hostile individuals from the urban community (controls group 2) suffered more episodes of stress as opposed to their highland counterparts who suffered occasional stress. Highland controls coped with their stress by confiding with significant others rather than smoked more cigarettes and consuming more alcohol. Table 5 showed the detailed result.

*Table 5: Comparison between high hostile Controls (1) and controls (2) (Ho score >20) with respect to episodes of stress per week, stress coping mechanism by (a) talk to others, (b) drinking more, (c) smoking more, (d) eating more*

<b>N</b>	<b>Case (4)</b>	<b>Control 1 (4)</b>
Episode of stress @ 3 to 4 times per week	0(0%)	6 (100%)
Talk to others	4 (100%)	1 (16.7%)
Drink more	0	2 (100% n=2)
Smoke more	0	5 (100% n=5)
Eat more	1 (25%)	1 (16.7%)

From the admission register of two hospitals included in the studies, less than 2% of the male patients admitted during the period of January 1998 to October 1999 were diagnosed to have CHD. Of the 12 patients who were traced and included in this study 30.3% scored high on the hostility scale (>20). Three out of four of these patients were heavy smoker (20 sticks/day) and all of them were drinking alcohol daily. They experienced stress three to four times a week and although they managed their stress by talking to others, they were also found to drink more, smoke more and eat more. About 16.7% of the age-matched healthy controls from the same communities were found to have high level of hostility. They smoked but were not heavy smoker and they drank the same type of alcohol drinks as their counterparts. The main difference as compared with their CHD counterparts was that they experienced occasional stress and managed their stress by talking with trusted significant others.

Twenty-four matching subjects, who were age-, sex-, religion-, occupation-matched, from an urban community were selected as a comparative sample for those healthy samples from Crocker Range. Out of this sample, 25% were found to have higher level of hostility. All of them were found to experience stress daily and they drank and smoked more in times of stress although sometimes they were able to share their problems with trusted others. This sample was from nuclear family with their extended families staying far apart from them.

## **DISCUSSION**

Our study attempted at finding a correlation between living in a conducive environment such as the highland of Crocker Range Sabah with the individual's affective component of hostility and predisposition to CHD. A conducive environment is taken as an environment where there is less energy and time demands in daily life and with good social support system. The findings of our small survey appeared to suggest that highland individuals with high level of hostility experienced fewer episodes of stress as compared with hostile individuals in the urban area. Each individual interprets and copes with stress differently. Our result showed that the ways these two groups of hostile individuals handled their stress differed and urban hostile individuals tended to handle their stress by engaging high-risk health behaviours.

Hostile people are cynical about others, and they are anger-prone (Smith, 1992). Thus Williams and colleagues (1985) proposed that hostile people displayed exaggerated cardiovascular reactivity (CVR) and neuroendocrine reactivity in response to stressors. These physiological changes have been hypothesized to initiate the pathogenesis of CHD and also hasten the exacerbation of existing CHD lesions. The possible association between hostility

and CHD has been amply studied since the late 1970s. The findings of these studies showed contradicting results regarding hostility-CHD association. Of late, researchers suggested that probably there was a need to investigate the inter-relationships between different psychosocial factors and CHD.

Several longitudinal studies (Barefoot et al. 1983; Barefoot et al. 1989; Shekelle et al. 1983) and cross-sectional studies (Joesoef et al. 1989; Meester and Smulders 1994; Ricci Bitti et al. 1995) have provided substantial evidence to support a link between hostility and CHD. The temperament and physiological responses to stress may contribute to the vulnerability of hostile individuals to CHD (Dembroski et al. 1985).

Hostility, a personality trait, is regarded to be a multidimensional construct, consisting of a cognitive, an affective and a behavioural component. The cognitive component of hostility is dominated by cynicism, the affective component is represented by anger, resentment, disgust and contempt, while verbal expression of subtle manifestation of aggression are regarded as its behavioural component (Barefoot 1992). The affective component of hostility is more vulnerable to stress resulting in stress responses. Hostile individuals were observed to respond to various stressors with larger CVR (Suraz et al. 1993; Jorgensen et al. 1995). Siegman and Smith (1994) suggested that hostility might be translated into CHD through repeated and/or exaggerated episodes of CVR. Humans may be born with high level of hostility, but in the absence of constant stimuli (stressors) in the environment, its affective component may not be expressed frequently. If the affective component is less expressed, it can be deduced that these hostile individuals would have experienced less episodes of CVR. In turn, this may reduce their risk for CHD in the absence of other risk factors such as hypertension, cigarette smoking, alcohol consumption and hypercholesterolemia.

Theories hold that social support leads to physical consequences by helping people avoid high-risk health behaviour (Spigel 1995). Alloway (1987) proposed that social supports might act to buffer the effect of various environmental stressors and hence decreased susceptibility to disease. Caution needs to be applied while interpreting the findings of the present study. First, the most important limitation is undoubtedly the small sample size. Second, selection bias might have affected the results of this study. The cases included only those patients who were traceable during the study period. Should all the patients identified were studied, our study might yield a different result. Third, the controls were recruited using convenience sampling and this may produce less accurate and less representative samples and therefore limit the confidence of generalization of the findings.

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