ANGER, ANGER EXPRESSION STYLES, HOSTILITY, IRRITABILITY AND CARDIOVASCULAR DISEASES
A large number of studies have found consistent relationship between cardiovascular diseases and various personality and behavioural characteristics that are often found in mild and borderline hypertensives e.g. anger, expression of anger, hostility and irritability.

ANGER

Anger is a very important psychological construct and has figured prominently in cardiovascular research. Feelings of anger are inevitable part of everyday life but people vary considerably in the ways in which they manage and express anger. Anger is common, universal human emotion. Beginning in the first year of life, human infants of all cultures show clearly defined facial expression of anger and this capacity to experience and express anger persists across the lifespan. Over the years, the concept of anger has attracted a negative reputation and it is considered as a bad emotion. In the social psychological literature, the term “anger expression” and hostility are used loosely, sometimes interchangeably.

Anger refers to unpleasant emotional state ranging from mild irritation or annoyance to rage and fury, usually in response to perceive mistreatment or provocation. On the basis of careful examination of the research literature on anger, hostility, and aggression, Spielberger et al., (1988) proposed the following definitions of these constructs:
According to Spieiberger, "the concept of anger' refers to an emotional state that consists of feelings that vary in intensity, from mild irritation or annoyance to intense fury and rage. Although 'hostility' usually involves angry feelings, this concept has the connotation of the complex set of attitudes that motivate aggressive behaviours directed toward destroying objects or injuring other people. While anger and hostility refer to feelings and attitudes, the concept of 'aggression' generally implies destructive or punitive behaviour directed towards other persons or objects'.

**EXPRESSION OF ANGER:**

Individuals may be typically classified as "anger – out" if they expressed anger towards other persons or objects in the environment. Anger – out generally involves an increase in state anger and the manifestation of aggressive behaviour. Anger directed outward may be expressed in physical acts, such as assaulting other persons, destroying objects and slamming doors or expressed in criticism, insults, verbal threats and the extreme use of profanity (Spieiberger et al., 1988).

Persons who direct this anger inward towards ego or self or who hold in (suppress) the anger are classified as "anger – in". With psychoanalytic conception, thoughts and memories relating to anger provoking situations, and even feelings of anger themselves may be repressed or denied. But in contrast, the suppressed anger is consciously experienced as an emotional state, i.e., state anger, varying in intensity and fluctuating over time as a function of the provoking circumstances (Spieiberger, et al., 1988).
Since expression of anger is distinct from experience of anger, control of anger is another facet of anger expression. **Anger control** refers to individual's efforts to control one's temper, keep one's cool and calm down faster.

**HOSTILITY**

Hostility refers to the state of exhibition of aggression or violence. Movement against others is generally discouraged by members of social system, unless it is directed against sources of threat to the group itself. Such behaviour is generally described as "hostile" or "aggressive".

The term "hostile" is generally used to characterize the attitudinal background of the behaviour, whereas the term "aggressive" usually refers to the act of moving against another person or object.

Buss (1961) in his review of theory and research dealing with aggression, defined **aggression** as a response that delivers various noxious stimuli to another organism. Buss (1961) defined **hostility** as an implicit verbal response involving negative feelings (ill will) and negative evaluation of people and events.

Foulds (1965) defined hostility as a unitary drive or entity which could be directed inward towards the self or outward against other persons or objects.

Darwin (1965) defined hostility as a wish for a specific class of goals to case pain, distress or anxiety to another person or a surrogate of that person.
Plutchik (1980) viewed hostility as a mixture of anger and distrust associated with indignation, contempt and resentment.

**IRRITABILITY**

Irritability may be described as anger which may remain latent or become manifest in angry aggression. Irritability represents a readiness to explode with negative affect at the slightest provocation. It includes quick temper, grouchiness, exasperation and rudeness (Buss, 1961).

The Longman Dictionary of Psychology and Psychiatry defined irritability as "a state of excessive, easily provoked anger, annoyance or impatience, also the capacity of living matter and particularly nervous tissue to respond to stimulation".

**REVIEW OF RELATED STUDIES**

The relationship between hostility, anger dimensions and increased cardiovascular reactivity has been reported in many studies (Goldstein, 1981). In particular, higher levels of blood pressure and sustained elevation have been related to ineffective management of anger (Rosenman, 1984; Weiner, 1977) that is manifested by the inability to express it. Anger, hostility and aggression have long be regarded as important factors in essential hypertension and coronary heart disease (Diamond, 1982). The tendency to suppress anger is observed in adults with hypertension (Cottington et al., 1986) but particularly appears to characterize younger subjects with borderline hypertension (Julius et al., 1985). Goldstein (1981) found that enhanced cardiovascular reactivity is
exhibited by subjects who exhibited high levels of hostility and anger while others conversely have found that higher reactivity occurs in the subjects who exhibit low level of same attributes (Houston, 1986).

Harshfield et al., (1985) found an association between the variability of the blood pressure and the level of hostility in studies using ambulatory monitoring whereas Thailer et al., (1982) found suppressed anger and submissiveness appear to be more related to sustained elevated blood pressure.

A causal contribution of hostility / anger dimensions to the pathogenesis of Essential Hypertension is supported by the findings in the prospective study of Isrealian civil servants (Houston, 1986). Rosenman et al., (1982) found that Type A subjects tend to exhibit an enhanced level of hostility / anger and this appears to be particularly relevant for the relationship of the Type A behaviours that characterize coronary prone behaviours. In this regard, the lack of association may reside in the fact that Type As do not exhibit unexpressed anger as in borderline hypertensives.

Earlier studies investigating the relationship between anger – in and Essential Hypertension contained methodological flaws including sample problem, design problems, the lack of operational definition of anger, hostility and aggression and of reliable scale measures of these constructs (Spielberger et al., 1988).

Impressive evidence of a strong relationship between suppressed hostility ("anger – in") and hypertension has also been reported by Harburg and his associates (Gentry et al., 1982; Harburg et al., 1973, 1979). Dunbar (1943), a
pioneer in psychosomatic medicine, was among the first to note an association between aggression and coronary heart disease (CHD). She identified a “coronary personality” in CHD patients, whom she described as ambitious, hard-driving, and markedly aggressive, with a strong need for achievement and success.

The large body of work done over the years by the Jenkins group (Jenkins, et al., 1978, 1979) also deserved separate mention. These workers showed an association between their A-B personality and coronary heart disease (CHD) and concluded that Type A deals with angry feelings either by undercontrol and frequent expression, or overcontrol and unrealistic denial.

Matthews et al., (1977) found that individuals developed CHD were rated significantly higher than age-matched healthy controls on each of the following characteristics: “Potential for hostility”, “Anger directed outward”, “Subject gets angry more than once a week”, “Irritation at waiting in lines”, “Subject’s answers are vigorous”, “Explosive voice modulation” and “Competitive in games with peers.” All these seven characteristics are either directly related to anger/hostility or possibly motivated by anger. Thus, the experience and expression of anger and hostility would seem to be a major coronary prone component of the TABP.

Williams et al., (1987) found that hostility and cynicism were related to the presence and severity of CAD, as measured by coronary angiography. Similarly, Dembroski et al., (1985) reported that potential for hostility was associated with CAD, but only for patients who suppressed the anger (“anger-in”).
Ray and Bozek, (1980) observed that when the A-B concept is demystified it turns out to be little more than a combination of dominance and aggression. Ray (1986) has in fact presented evidence leading to the view that “A-B” predicts CHD only in so far as constitutes an index of dominance and aggression.

Diamond (1982) found that anger, aggression and hostility were the necessary personality features of both CHD sufferers and hypertensives. (Eysenck, 1985) found that neuroticism is related to high blood pressure but both found that CHD and EHT were positively related to anger.

Matthews et al., (1977) and Dembroski et al., (1988) in the Multiple Risk Factor Intervention Trial, found that men with high potential for hostility (a behavioural rating correlated with high verbal and physical expression of anger), had an adjusted relative risk of CHD of 1.5 (P=.03) (Koskenvuo et al., 1988). In the determinants of Myocardial Infarction (MI). Onset Study, a crossover study of 1623 patients, episodes of anger were found to be potent triggers of acute MI. Using this design, the relative risk of MI in the two hours after an episode of anger was found to be 2.3 (MI) 20 cases of fatal CHD and 60 cases of angina pectoris. Compared to men reporting the lower levels of anger, the multivariate adjusted relative risk among men reporting the highest levels of anger were 3.15 (95%) (Mittleman et al., 1995).

Two other experiments conducted by Harburg et al., (1973) support the position that in anger situations in which blood pressure is raised, the blood pressures returns readily to normal when subjects are permitted to behave in a hostile manner to the source of anger. Experimental evidence demonstrates that
blood pressure increases occur to “anger instigating” situations. Clinical observations too indicates that in anger producing situations, blood pressure rises in hypertensive persons. It also rises under similar circumstances in the normal person.

Exaggerated cardiovascular responses during behavioural challenge have been proposed as a mechanism linking hostility and style of anger expression with risk of hypertension and coronary heart disease (Diamond, 1982; Krantz and Manuck, 1984) studies on the associations between various anger, hostility or anger expression measures and the magnitude of the increase in blood pressure and heart rate during laboratory challenges relative to resting values do show, on balance significant relations (Houston, 1988). However, direction of association between anger expression and reactivity varies across studies. Dembroski et al., (1988), Diamond et al., (1985) and Van Egeren et al., (1978) showed that outward expression of anger is associated with greater blood pressure and heart rate reactivity whereas Funkenstein et al., (1954), Hobroyd and Gorkin (1983), McDougall et al., (1981) found that holding anger or anger - in is associated with greater reactivity.

Although the Anger Expression Scale was only recently developed, empirical findings linking anger Expression/In and anger expression /Out to hypertension and the Type A behaviour pattern are encouraging. Johnson (1984) found that high school students with high anger Expression/In scores had higher blood pressure and those with high anger Expression /Out scores had lower BP, than students with low anger Expression/In scores. Type A college students were
found to have higher anger Expression/Out scores than type Bs (Williams & Jenkins, 1986). Krasner (1986) replicated this finding, and also reported that Type As were higher in T-anger and had lower anger Expression/Con scores than Type Bs, suggesting that Type As experience more anger and are less effective controlling it. Solomon (1987) has recently reported that college students who were high on anger Expression/Con and low on anger expression/Out had higher scores on a measure of emotional defensiveness that had predicted morbidity and mortality for both heart disease and cancer in a prospective study. She also found that students with high anger Expression/In scores were more likely to report prolonged periods of hopelessness and depression.

The results of several recent studies in which the Anger Expression Scale was used to measure anger expression were reported. In these studies, higher scores on the anger Expression/In subscale were related to elevated blood pressure, lack of assertiveness, and reports of prolonged periods of hopelessness and depression. Individuals with high scores on the anger Expression/Out subscale had slightly lower BP, were more assertive, and more likely to be classified as Type A. Preliminary findings with the recently developed anger Expression/Con subscale indicated that college students with high scores were less likely to be classified as Type A, experienced anger less frequently, and were less likely to engage in aggressive behaviour. However, they were more likely to use denial and repression as defenses against unacceptable anger impulses. A study in which the Anger Expression Scale was used as an outcome
measure to evaluate the effectiveness of anger reduction treatment programs was also reviewed.

Personality variables associated with EHT include anger - in, coping style (Alexander, 1939; Spielberger et al., 1985) and Neuroticism (N) (Davis, 1971; Vaidya, Srivastava and Kumar, 1983).

Other personality variables which have been associated with essential hypertension include Type A behaviour pattern (TABP), introversion and low sensation seeking (SS). The Type A pattern might be expected to relate to EHT since Type A have been found to have greater amount of catecholamines in response to environmental and biochemical changes (Siegel, 1985) and Norepinephrine is involved in blood pressure elevation.

The above mentioned studies highlight the importance of assessing the relationship of anger / hostility with Cardiovascular Diseases (CVD). Need is also there to explore how different anger expression styles relate to CVD.