STRESS, STRAIN, DAILY HASSLES, WAYS OF COPING AND CARDIOVASCULAR DISEASES
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There is an overwhelming evidence to suggest a link between psychological stress, strain, daily hassles, ways of coping and cardiovascular diseases.

STRESS AND STRAIN

The concept of "stress" continues to generate interest because of its role as a causative factor in certain illnesses. Stress is a uniform human experience and a shortened form of distress.

According to Baum et al., (1985), stress by itself does not lead to an illness unless an individual has difficulties in dealing with the situation due to his/her personality characteristics. Despite its current prominence among scientific issues of popular interest, research in this field has been plagued with controversy. As Selye (1976) so aptly wrote "stress suffers from mixed blessing of being too well known and too little understood". Some scientists assert that the stress concept has become too over-generalized encompassing both the stressor and the response, while some argue that the construct provides an important focus for research in health and disease. Sarafino (1994) postulated that the stress of contemporary life could impair immunologic functioning and increase susceptibility to disease.
The Dictionary of Psychology and Psychiatry defines stress as “a state of physical and psychological strain which imposes demands for adjustments upon the individual. Stress may be internal or environmental, brief or persistent......”

The term ‘stress’ has been used to signify environmental agents which disturb structure and function as well as responses to such agents. It has had physiological referents as in Selye’s adaptation syndrome as well as sociological ones, as when an organisation or social system is disturbed. It has also had psychological meaning, referring to the variables operative in the appraisal of harm or threatened harm. These uses of the term ‘stress’ are quite different from each other. Although systems – oriented writers have often suggested analogies or parallels among them. Moreover, there are points of interactions among these levels of analysis (for example, disruptions of social systems e.g. economic depression, social changes, breakdown of law and order etc.) may create severe psychological damage to the individual in the system. This will in turn have the effect of disturbing the physiological homeostasis in affected individuals resulting in ulcers, cardiovascular disorders or behavioural disturbances related to emotion and coping. Actually, such interaction between the events at each level of analysis serve to bring together the multi-disciplinary group (Elliot and Eisdorfer, 1982).

Selye (1976) opined that it is useful to define ‘stress’ in terms of stimuli external to the organism which provoke it to either fight or flight. Selye differentiates the life preserving reaction as healthy stress (e.g. immediate flight or fight reaction of a cat when provoked) from what he calls ‘distress’
contrast to the stimulus – defined measures being used earlier in stress research. The Stress Symptoms Rating Scale is an inquiry into the amount of stress experienced without regard to what provoked them. This is used in health research for propose of detection of stress symptoms.

**DAILY HASSLES AND UPLIFTS**

Hassles are irritants – things that annoy or bother you, they can make one upset or angry where as uplifts are events that make one feel good, joyful, glad or satisfied. Some hassles and uplifts occur on a fairly regular basis and others are relatively rare. Some have only a slight effect, others have strong effect. The role of daily stress or hassles as a causal factor in illness has motivated widespread use of measures of stress based on life events and daily hassles.

**WAYS OF COPING**

The conceptualization of coping processes is a central aspects of contemporary theories. The term coping is viewed as a stabilizing factor that may help individuals maintain psychological adaptation during stressful periods (Folkman and Lazarus 1985; Billings and Moos 1985).

At a general level, coping has been broadly defined as “any efforts at stress management” (Folkman and Lazarus 1988). According to Pearl and Schooler (1978), ways of coping can be viewed as “things that people do to avoid being harmed by life strains”. Lazarus (1983) described ways of coping as ‘overt’ and ‘covert’ behaviors that are taken to reduce or eliminate psychological
resulting from the impossibility of either flight or fight (as in the case of an imprisoned cat or man). Stress is what induces a change in a living system but having the following qualifying criteria: (a) recent in time, (b) effectively upsetting or producing fear/anxiety, (c) representing a threat to social wellbeing or to survival, (d) more often non-physical in nature. Experiences like pain or fear can be stressors (Dohrenwend and Dohrenwend 1980, Brown 1980, Lazarus et al., 1980).

According to Houston (1986), 'stress' may be thought of as a non-specific set of responses the body makes to demands that are made upon it. Often, these demands correspond to those that produce high arousal.

**STRAIN AND STRESS SYMPTOMS**

Strain as a concept has been defined as "a term used to indicate excessive tension in a muscle or nerve unit usually due to an activity overload or in psychological adjustment, usually due to emotional overload."

The problem of stress is neatly expressed by Cohen et al. (1995) 'stress is one of those peculiar terms which is understood by everyone when used in a general context but understood by very few when an operational definition is desired' which is sufficiently specific to enable the precise testing of certain relationships.

**STRESS SYMPTOMS**

Heilbrun and Pepe (1985) constructed the Stress Symptoms Rating Scale. He said that stress symptoms are a response – defined measure of stress in
distress or stressful conditions. Coping styles vary from problem-focused to emotional ones and different coping styles are used by different individuals to manage stress.

Fleishman (1984) defined coping as cognitive or behavioural responses “to eliminate psychological distress or stressful conditions.”

One of the most popular instruments for assessing coping is the Ways of Coping Questionnaire (WOC) constructed by Folkman and Lazarus (1988). This has been used in a wide range of different populations. The ways of coping questionnaire assesses thoughts and actions individuals use to cope with the stressful encounters of everyday living. It is derived from a cognitive–phenomenological theory of stress and coping that is articulated in stress appraisal and coping (Lazarus and Folkman, 1984). The various subscales of the WOC Scale are:– Confronting Coping, Distancing, Self Controlling, Seeking Social Support, Accepting Responsibility, Escape Avoidance, Planful Problem Solving and Positive Reappraisal.

The ways of coping questionnaire has been widely used ranging from community samples (Aldwin and Revenson, 1987), and student nurses (Parkes, 1986), to parents of children with Down’s syndrome and spouses of patients with Alzheimer’s disease (Vitaliano, Russo, Carr et al., 1985).

REVIEW OF RELATED STUDIES

The relationship between an individual’s experiences with stressful life events and the subsequent onset of a physical illness or physiological
disturbance has become increasingly well documented in the theoretical and empirical literature. Dohrenwend and Dohrenwend (1974), Johnson and Sarason (1979); Rabkin and Struening (1976) suggested that the relationship between life stress and psychological disturbance through statistically significant but relatively small in magnitude. An important area of investigations thus concerns the identification of factors that act as buffers against the adverse effects of life stress. The existence of such factors has been posited by theorists such as Selye (1956) who suggested that individuals respond in a distinctive manner to stressors and Antonovosky (1968) who discussed individual’s possession of resistance resources.

It has been suggested that certain personal characteristics may serve as buffering the relationship between stress and illness (e.g. Kobasa 1979, Lefcourt, Martin and Saleh 1984). Interestingly while many studies have described personality characteristics (e.g. Light and Obrist, 1983m McClelland and Jemmott, 1980) and several others have examines the relationship between stress and the ability of this group to cope (Rodin and Salovey, 1989), few have described the role of psychosocial resources and stress in the chronic illness experience (Lee 1993). Pearlin and Schooler (1978) proposed several personal characteristics that have been shown to buffer the impact of stress: absence of self - denigration, mastery and self esteem. Additional proposed resources include a sense of coherence (Antonovosky 1968). Self efficacy (Bandura, 1977), Hardiness (Kobasa 1979), Personal competence (Hussaini et al., 1982), Locus of Control (Wallston and Wallston 1982), social support (Cobb, 1976),
hopelessness (Schmale, 1972), fatalism (Wheaton, 1982), premorbid pessimism and low cooperative coping style (Taylor and Cooper, 1989).

The assertion that stress can affect health raises the question of how that might occur. A review of evidence of "psychoimmunologic nexus" or the relationship between psychological factors to the incidence of coronary heart disease against which the immune system defends would possibly provide answers to the question. Logically, if the functions of the immune system were to be impaired, the host would be more vulnerable to disease. There is also an empirical evidence that given exposure to a specific disease agent, a reduction of function increases the likelihood that full blown clinical disease will develop. Nonetheless, research on stress and immunity has great heuristic and theoretical value, for it highlights a way in which stress can alter resistance to diseases (Cohen and Lazarus, 1973).

It is believed that over seventy five percent of illnesses are thought to be triggered off by stress. Research have shown that stress increases susceptibility to psychosomatic illness i.e. stress related diseases like asthma, gastrointestinal disorders, neurodermatitis (skin disease), migraine, hypertension, coronary heart disease, obesity, long eye syndrome and post – chromatic stress disorders (Sarafino, 1994).

Monjan, (1981). Sklar and Anisman (1981) while conducting experiments on lower animals found that chronic physical stress is associated with enhanced immunocompetence. The distinction between physical and social stress may be of critical importance because some data indicate that the effects of social stress
on the mature animals' immune system are not influenced by chronicity of exposure (Sklar and Anisman 1981). In human studies it is difficult to unequivocally classify most stresses as solely physical or social but most researchers agree that certain stresses have a larger psychological or physical component than others.

Ivancevich and Matteson (1980) and Matteson and Ivancevich and Matteson (1984) proposed a multi disciplinary model for organizational stress research. The model proposed that there were antecedents (stressors) leading to perceptual stress. These antecedents can be classified as either intraorganizational or extraorganizational stressors. The intraorganizational include factors such as organizational climate, management style, job design and group conflict. Extraorganizational stressors include factors such as family relations, residential area, and economic factors. Perceived stress can be modified by individual characteristics such as age, sex and personality facets. Stress in turn leads to both behavioural and physiological outcomes. The behavioural outcomes include life satisfaction, performance and absenteeism. The physiological outcomes include changes in serum cholesterol, blood pressure and adrenal harmones. The model proposed that these outcomes may eventually lead to consequences such as coronary heart disease (CHD), ulcers and allergies. Similar models have been suggested by Cooper and Marshall (1976) Parasuramam and Alutto (1984). Caplan and Jones (1975) have suggested that stress responses (strains) include not only behavioural and physiological factors but also psychological such as job satisfaction. Stronger
relationships have been found between stressful life events and depressed mood, physical symptoms and illness in women (Cronkite and Moos, 1984; Matheny et al., 1986).

A major component of a comprehensive stress model should be coronary heart disease (CHD) and hypertension (EHT) because stress has been linked to CHD (Cooper and Payne, 1978). Research on stress is important not only from the disease and physical health perspective but also from the psychological perspective.

Glaser and Glaser (1982) studied 100 patients who had stress tests and coronary angiography and found that stress test predicted correctly 89 percent of the true negatives and 62 percent of the true positives identified through angiography. Dody (1980) reported that in a large scale study of over 450,000 stress tests, complications per 10,000 cases were 3.5 infarction, 48 serious arrhythmias and 0.5 deaths. Two factors frequently used in the prediction of coronary heart disease (CHD) in stress tests are total serum cholesterol and high density lipoprotein (HDL) cholesterol (Glaser et al., 1987). These factors have been found to be uncorrelated with each other but less accurate in predicting CHD than is the ratio of total serum cholesterol divided by HDL cholesterol (Malaspina et al., 1981). Malaspina et al. (1981) concluded that the cholesterol ratio is one of the best single laboratory lipid predictor of coronary heart disease. This is based on the findings of the research carried out in France, U.K. and U.S. in which 572 asymptomatic aircrew members were screened for coronary heart
Numerous studies have found that acute stress and lifestyle can increase one's total cholesterol level (e.g., Friedman et al., 1957). Increase in catecholamine levels due to stress has been well documented (Dimsdale and Moos, 1980; Lundberg and Frankenhaeuser, 1980). High catecholamine levels have been related to the development of atherosclerosis and predisposition to heart attacks (Karasek, 1979). Other diseases such as peptic ulcers (Susser, 1957), arthritis (Cobb, 1976) and hypertension (Cohen et al., 1995) have also been linked to stress. In fact, most current medical researches attribute 50-70 percent of illnesses to stress-related origins (Ivancevich and Matteson, 1980). Besides the progressive increase in the incidence of heart attacks in more industrialized countries especially in comparison with less industrialized countries has suggested a causal relation between the emotional stress imposed by the modern, competitive, fast-paced industrialized society and the development of coronary heart disease.

Rosenman and Chesney (1982) in studying hundred patients under age of 40 who developed coronary heart disease, discovered that for ninety one of them, severe emotional stress preceded the attack. They also suggested that certain personality characteristics such as intense recognition motives, compulsive personality and scrupulosity were widely shared among the patients.
There is an extensive evidence to indicate that many normal individuals display sharply increased blood pressure in stressful or emotional situations. Probably, the most frequently cited cardiovascular disorder is essential hypertension, a condition associated with intermittently or chronically elevated blood pressure (Spielberger, 1989).

The studies by Harburg et al., (1970, 1973) found a significantly higher percentage of young blacks (< 40 years) males who were hypertensive in the high stress areas as compared to the low stress. Young black men in high stress areas were 2.5 times as likely to have diastolic blood pressure of ≥ 95 mmHg than those living in low stress areas. Syme (1979) suggested that these results might reflect the greater efforts by these younger black males to gain control over difficult, uncontrollable circumstances.

Cohen and Herbert (1996) investigated the mechanisms responsible for increase in heart rate and blood pressure during psychological stress. They compared the responses to laboratory stressors of twenty ambulatory heart transplant recipients and two groups of normal subjects, one whose ages were matched to ages of the transplant patients (Mean = 46 years) and one whose ages were matched to the ages of the heart donors (Mean = 27 years). The three groups performed mental arithmetic and reaction time results. The results showed that heart rate increases during mental task and was significantly attenuated in the transplant patients. It was also found that during stress, stroke volume increased in the transplant recipients but decreased in both groups of comparison subjects.
Cohen et al. (1986) while investigating the contribution of psychological stress to the development of hypertension and coronary heart disease and found that men in high strain jobs are more likely to be hypertensive as compared to men in less stressful jobs.

Dembroski et al. (1990) while studying aerobic fitness, psychological characteristics and cardiovascular reactivity to stress using sixty two men divided into highly fit and less fit groups based on a maximal treadmill exercise found that highly fit subjects showed a significantly smaller increase in both diastolic blood pressure (DBP) and heart rate and reported themselves to be less anxious and less angry than less fit subjects.

Clover et al. (1989) while studying the mechanisms by which stress can lead to coronary heart disease found that the post-traumatic stress syndrome relates to coronary-prone personality for it involves emotional disturbance. Luolu (1990, 1994) investigated the relationship between major and minor stressors, personality characteristics and mental health among university first year students found that university transition and cultural relocation was rather stressful in terms of emotional distress for a group of overseas Chinese students in U.K.

In some other studies like Delongis et al., (1988), Luolu (1991) investigated the relationship between life stressors and mental health and found that major life events and daily hassles are strong predictors of psychological distress. Saldanha et al., (1993) in a study of personality profiles of coronary heart disease cases in India found that psychological stress and depression were
statistically significant in coronary cases compared to controls. Coronary cases showed significantly lesser number of sex and anatomical responses as compared to normals.

Stress is not a simple variable but a system of interdependent processes including appraisal, personality, social support and coping which mediate the frequency, intensity, duration and type of psychological and somatic responses. Stressors or stressful circumstances refer to experiences of negative life events and chronic life strains which are culturally or personally undesirable, changes in the usual activities of an individual that requires substantial behavioural adjustments (Brown and Harris, 1978; Holmes and Rahe, 1967). Examples included such normative life transitions as the empty nest syndrome, bereavement and involuntary retirement and non normative changes as divorce, job loss, economic hardship, serious illness etc.

Stein et al., (1976) found that aversive and psychosocial stimuli were capable of producing both temporary and long lasting increases in arterial pressure and blood level elevations. Psychological stress an lead to biochemical alteration that are potential causes of a disease although the disease does not originate through this mechanisms alone.

Stress calls into play dispositional variables, appraisal processes, coping mechanisms, reliance on social support, use of substances and the like (Russel and Davey, 1993). In many cases stress may damage health through a combination of these processes e.g. Type A behaviour leads to significantly higher cardiac reactivity under certain kinds of stress that are most meaningful to
Type A individuals (Matthews et al., 1986). The combination of stress and cigarette smoking may have greater addictive effect on blood pressure and heart rate response. (Dembroski et al., 1985). Similarly, consumption of caffeine under conditions of stress affects blood pressure, plasma cortisol level, serum cholesterol level especially among borderline hypertensives (Taylor and Cooper, 1989).

Stressful life events are commonly believed to alter immunity and hence susceptibility to immune system – mediated disease. When demands imposed by events exceed individual’s abilities to cope, a psychological stress response composed of a negative and emotional states is elicited. It is these responses that are taught to influence immune function through their effects on behavioural coping and neuroendocrine response. In a series of studies, Glaser et al. (1987) investigated the impact of medical school examinations on medical students cellular function assessing their psychological stress levels and immune responses during a low stress base line period (e.g. vacation) and during important exams. Students reported more stress during exams and showed a decrease in the function of a range of indicators of cellular immune response. Stressful life events that last for a longer term for example, months or even years have similar potential to influence the immune system. Baum et al., (1985) assessed stress effects on residents living near nuclear power plant which was a site of nuclear accident in 1979 and found that the distress among residents has remained high.
Daily hassles is another important variable which has made valuable contributions in health research. According to Rodin and Salovey (1989) a shift in the study of stress is towards the investigation of daily hassles rather than catastrophic life events. Hassles are experiences and conditions of daily living appraised as silent and harmful or threatening to wellbeing (Lazarus, 1984). Lazarus suggested that daily hassles shows a stronger relationship to health relevant variables such as psychological distress and physical symptoms reporting than do stressful life events. Major life events may affect health by creating new hassles or increasing intensity of existing ones (Lazarus, 1984).

Rehim (1978) investigated both mood and daily events across time points and found that average event level was not significantly correlated with average mood level across the same time. However using disaggregated data, within subjects correlations revealed significant association between increases in events and declines in mood.

Kanner et al. (1981), Delongis et al. (1982) and Weinberger et al. (1987) all found that daily hassles and uplifts are better predictors than major life events and indicate daily hassles are a truly independent predictor of stress which do not function by moderating the effect of major life events and independent of initial symptoms.

The ways of coping is a relevant aspect of stress – illness research. Exploring the connection between ways of coping, stressful life events and psychopathology ahs emerged as a significant research focus in recent years (Rosenberg, Peterson and Hayes, 1987). In this regard the manner in which
individuals cope with stressful life circumstances and the experience of depressive symptomatology have come to be seen as variables that are significantly interwined (Abramson et al., 1978; Beck, 1976; Fondacro and Moos, 1987). More specially, the coping styles that individuals adopt have been described as mediating between precedent stressful situations and such antecedent psychological consequences as depression (Billings and Moos, 1981, 1984; Pearlin and Schooler, 1978; Rohde et al., 1990).

Coping refers to a fundamental assumptions that people are actively responsive to forces that impinge on them (Pearlin and Schooler, 1978). Coping refers to efforts to master, reduce or tolerate a troubled person–environment relationship (Folkman, 1984; Folkman and Lazarus, 1980), and the coping process has been seen as a response or reaction to stressful life event (Endler and Parker, 1988b, 1988; Folkman and Lazarus, 1980, 1985; Wong and Reker, 1984). Endler and Parker (1990a) have considered the coping response from a multidimensional perspective and have through empirical methods identified three coping styles: task oriented, emotion oriented and avoidance oriented. Task oriented coping emphasizes the achievement of problem resolution through purposeful efforts or cognitively restructure the problem or alter the situation. (Endler and Parker, 1990a). Emotion oriented coping delineates a set of reactions (e.g. tension, anger) of a self oriented nature which occur in response to a problematic event (Endler and Parker, 1990a). Avoidance oriented coping involves reactions or responses which have the effect of
distracting or diverting individual’s attention from stressful situation (Endler and Parker, 1990a).

The concept of coping has until now been understood in different ways. From a sociological viewpoint, coping consists of the strategies that people adopt in order to avoid being harmed by various life stresses (Pearlin and Schooler, 1978). Within this framework, the coping concept has a crucial role in the study of the interplay between environmental stressors and the individual’s response to these stressors. However, it has been argued that coping mechanisms, although they act as responses to environmental stressors, cannot be separated from the individual’s responses to his or her own inner emotional life (Pearlin and Schooler, 1978). Thus, in the psychoanalytical framework, coping is defined as realistic and flexible thoughts and acts that solve problems and thereby reduce stress (Lazarus and Folkman, 1991). Neither of these interpretations of the coping concepts are fully applicable to the abnormal psychology seen in clinical psychiatry, where coping efforts often either do not fit into a problem-solving framework, or take the form of more primitive defense mechanisms and reflect responses to pathological (i.e. delusional) perceptions (Lazarus and Folkman, 1991).

Identifying the mechanisms through which coping may be related to outcomes has been approached from several directions. Wheaton (1983) and Kobasa (1979), for example, focused on characteristics of the personality that are antecedents of coping: Wheaton considered fatalism and inflexibility, and Kobasa considered hardiness. The assumption underlying this approach is that
personality characteristics dispose the person to cope in certain ways that either impair or facilitate the various components or adaptational status. However, there is little evidence that these personality characteristics do in fact significantly influence actual coping processes (Cohen and Lazarus, 1973; Fleishman, 1984).

A second approach is to assess the way in which a person actually copes with one or more stressful events. Billings and Moos (1984), for example, assessed the ways in which individuals coped with a single recent stressful event: they found such coping to be related to depression. The assumption underlying this approach is that the way in which a person copes with one or more stressful events is representative of the way he or she copes with stressful events in general.

A third approach is to focus on characteristics of the stressful situations that people experience. Studies in which the researchers assess how people cope with situations in which they have no control over the outcome illustrate this approach (e.g., Shanan, De-Nour, and Garty, 1976). The assumption is that people who are repeatedly in uncontrollable situations experience helplessness, become increasingly passive in their coping efforts, and ultimately experience demoralization and depression. Situations have also been characterized by the nature of the psychological threat they pose. Examples include studies of evaluation anxiety (e.g., Kronne and Laux, 1982) and loneliness (Jones et al., 1982; Schultz and Moore, 1984; Solano et al., 1982), in which researchers evaluate the ways in which people cope with situations that threaten their self-esteem. In these instances any relation found between coping and long term
outcome is probably due to the person's repeatedly experiencing stressful situations that touch on a particular area of vulnerability, insofar as a single, isolated instance of poor coping is not likely to have long term implications for health and well being.

A fourth and more sophisticated approach, which is illustrated by the work of Pearlin and Schooler (1978), is to consider the relative contributions of personality characteristics and coping responses to psychological well being. Pearlin and Schooler evaluated personality characteristics (mastery, self esteem, and self denigration) and the ways in which people cope with chronic role strains in relation to the amelioration of distress in each of four role areas: marriage, parenting, household economics and occupation. They found that personality characteristics and coping responses had different effects that were relative to each other, depending on the nature of the stressful conditions. Personality characteristics were more helpful to the stressed person in those areas in which there was little opportunity for control, which as at work, whereas coping responses were more helpful in areas in which the person's efforts could make a difference, such as in the context of marriage.

Lazarus and Folkman (1984) suggest three pathways through which coping might adversely affect somatic health status. First, coping can influence the frequency, intensity, duration, and patterning of neurochemical responses; second, coping can affect health negatively when it involves excessive use of injurious substances such as alcohol, drugs and tobacco, or when it involves the person in activities of high risk to life and third, certain forms...
of coping (e.g., particularly denial like processes) can impair health by impeding adaptive health/illness related behaviour. Other writers, such as Depye et al. (1979), emphasize stable patterns of appraisal as a critical pathway through which somatic outcomes are affected.

While the aforementioned review of literature highlights the association of stress both Daily Hassles and Life Event Stress with CVD, and has also shed light on coping processes with reference to stress handling, the results are not equivocal. It would be interesting, therefore to study the role of stress, strain and Ways of Coping in CVD in the present investigation.