STRESS EFFECTS IN HUMAN LIFE
CHAPTER - I

STRESS EFFECTS IN HUMAN LIFE

1.1 INTRODUCTION

Stress is an emotional strain term related to health, applied a wide range of strong outward or supper superficial stimuli, both physiological and psychological. The two types of stress eustress and distress may be the result of negative and positive events. Stress can directly and indirectly contribute to general or specific disorders of body and mind. Any factor that causes stress is called a stressor. Stressors are two kinds, namely processive stressors and systematic stressors. A kind of mental illness is such as organic disorders, Alcohol and drug-related disorders, psychotic disorders, affective disorders, Anxiety and related disorders and disorders of vegetative functions have been pointed out. Variations in responses to stress, adaptations to stress, Folklore of stress perspectives on social stress, current concepts of psychosocial stress and operational classification of stress tables the list of major categories of stress systems have also been discussed. General cognitive measures modifying the cognitive defects in social stress reactions are analyzed. Conceptual Frame and Research Strategy, experimental data are in accord with those of Mason and his associates have also been explained. Methodological considerations, manipulating controllability toward an integrative approach to the study of stress are also described. Dr. Selye and Folkman’s review of Biological and Psychological tradition considers many of these points in great detail. The
stress of life by Dr. Howart Loomis points out that health is much more than the absence of symptoms is described in sub titles. Thus stress is discussed through all level in this chapter.

1.1.1 STRESS AND ITS EFFECTS

Stress is an emotional strain term related to health applied to a wide range of strong outward or superficial stimuli, both physiological and psychological, which causes a physiological response called a general adaptation syndrome, this syndrome was first described by Han's Selye in 1936 in the journal nature.

Selye through his research was able to separate the biological effects of stress from other physical symptoms suffered by patients. He observed that the direct cause of disease which patients suffered physically by effect and not by their disease or by their medical condition.

Selye states the general adaptation syndrome as having three stages:

- Alarm reaction, where the body detects the external stimuli.
- Adaptation, where the body engages defensive countermeasures against the stressor.
- Exhaustion, where the body begins to run out of defenses.

Types of Stress

Eustress ("Positive Stress") and Distress ("Negative Stress"), roughly mean challenge and overload. Both types may be the result of negative or
positive events. If a person wins both the big prize and has a beloved relative die on the same day, one event does not cancel the other as both are stressful events. (Note that what causes distress for one person may cause eustress for another, depending upon each individual’s life perception.) When the word stress is used alone, typically it is referred to distress.

Serenity

Serenity is defined as a state in which an individual is disposition free or largely free from the negative effects of stress and in some cultures it is considered a state that can be cultivated by various practices, such as meditation and other forms of training.

Stress can directly and indirectly contribute to general or specific disorders of body of mind. Stress can have a major impact on the physical functioning of the human body. Such Stress raises the level of adrenaline and Corticosterone in the body, which in turn increases the heart rate, respiration, and blood pressure and puts more physical stress on bodily organs. Long-term stress can be a contributing factor to heart disease, high blood pressure, stroke and other illnesses.

Stressors

Any factor that causes stress is called a stressor.

There are two kinds of stressors

- Processive Stressors
- Systemic Stressors
Processive stressors as an element in the environment is perceived by the organism as potential dangers. These do not cause damage directly, but processed in the cerebral cortex.

The processed information is then sent via the limbic system in the hypothalamus, where they activate the supreme centers of the autonomic nervous system. This results in the fight or flight (or sympathetic-adrenal) response.

Systemic stressors cause disturbance in the organism's homeostasis, as well as tissues necrosis, hypotension and/or hypoxia, often both the types of stressors occur simultaneously. They are usually accompanied by pain and/or intensive emotions.

Coping with Stress

Individuals can react very differently to the same stressor. Any given situations can cause eustress in one person and distress in another. This happens because of differences in physiology and life circumstances, as well as different methods of stress management. Method of copying that work well in childhood situations often become deeply embedded and habitual, and often follow the child into adulthood. In the adult world, these skills can be quite inappropriate, and stress heightens as the person sticks to absolute behaviours. At present there are many classes, books, and seminars available to help people to develop better habits of managing stress.
Selye gave a critical comment on the physiological changes measured in the practitioners of Transcendental Meditation (TM). He concluded his review by stating that such changes were the opposite of the body's reaction to stress. The therapeutic effect of TM was the most distinct in people whose coping skills were poorly adapted to the stress of daily life.

A number of psychological and sociological factors have been consistently demonstrated to act as a moderator against stress in the development of chronic psychological or physical disease (such as depression or hypertension). Among these many factors are chiefly: optimism or hope, social support, Socioeconomic Status (SES) Sense community, and others.

1.2 MENTAL ILLNESS

Mental illness is a disease of the mind that affects a person's thoughts, feelings or behavior. They have periods of sadness, anger and fear. They suffer from extreme moods and feeling that may last for years. The disturbances often cause unhappiness and lead to socially unacceptable behavior. The people react to their condition in various ways. Some explain their behaviour by blaming other people and some others withdraws from reality and seems unaware of their surroundings. In severe cases, they may cause physical harm to themselves or to others.

Mental illness affects people in all various and at all economic levels. Therefore, the definition of mental illness varies from culture to culture.
Mentally ill people can get help from various sources. Some patients receive treatment from psychiatrists and psychologists and others obtain help at clinics and community mental health centers. But severe patients require hospitalization because they cannot take care of themselves properly. Psychiatrists sometimes refer to mental illnesses or mental disorders, "emotional illnesses or psychiatric illness. The legal term "insanity" is used to describe a mental illness so serve that the person is considered not legally responsible for his or her acts.

1.2.1 MENTAL ILLNESS TERMS

- Anxiety is a condition of worry, tension or uneasiness produced by the anticipation of some danger whose source is largely unknown.
- Compulsion is an irresistible impulse to perform a certain action.
- Delusion is a false belief that a person maintains in spite of evidence that proves untrue.
- Depression is a mental disorder characterized by feelings of deep sadness, hopelessness and worthlessness.
- Hallucination is the sensation of something that does not really exist. Illusion is a distorted perception of reality.
- Mania means a mental disorder that involves extreme optimism and excessive energy, often accompanied by mood disorder is a mental illness that mainly affects a person’s mood.
• Neurosis is a mild mental disorder.

• Obsession is a recurring thought that a person is considered senseless or terrible but cannot be ignored.

• Organic disorder refers to mental illness those results from a physical cause, such as a birth defect, a disease or an injury.

• Paranoia is a mental condition in which an individual unjustifiably feels threatened by other people.

• Phobia means a strong, unreasonable fear of a particular objects or situation.

• Psychosis is a severe mental disorder characterized by delusions, hallucinations and unable to deal with reality.

• Schizophrenia is a severe mental disorder characterized by unpredictable thoughts and behavior and a withdrawal from reality.

• Unconscious refers to thoughts and feelings that a person is not directly or fully aware of it.

Kind of Mental Illness

There are six main categories of adult psychiatric disease:

1) Organic disorders

2) Alcohol and drug-related disorders

3) Psychotic disorders other than those in the organic or affective groups
4) Affective disorders

5) Anxiety and related disorders and

6) Disorders of vegetative functions.

The two adult disorders are

(i) Personality disorders

(ii) Stress induced disorders.

Psychiatrists sometimes also use the term ‘neurosis’ and ‘psychosis’ for mental illness. A neurosis is a mild disorder that causes distress but does not interfere greatly with a person’s everyday activities. Most anxiety disorders and personality disorders are considered neurosis. A psychotic illness such as schizophrenia is a severe mental disorder that prevents the individual from functioning in a normal manner.

**Organic Disorders**

The most common organic disorders are delirium and dementia. This is due to physical cause such as birth defect, a disease, or an injury. Delirium is a disorder in which a person loses awareness of his or her surroundings. People with delirium speak in a disorganized manner. They may have ‘illusions’ (disordered visions) or hallucinations (sensations with no real basis). Some delirious people become excited and irritable, but others appear listless and withdrawn. This disorder is more common among children and elderly people. This is a short term disorder. Causes of delirium include liver or kidney disease, fever, head injuries and intoxication.
1.3 VARIATIONS IN RESPONSES TO STRESS

Many stresses may include the same reaction but in some systems (Ex. The adrenal cortex) stress responses occur across a wider spectrum. Furthermore, some of these responses are highly differentiated that is, by stressor. The physiological and behavioral adaptations to water deprivation have features distinct from, say, the response to extreme heat or cold, or to the presence of a threatening nonspecific.

Stress itself is not an absolute or a varying process. (ex. a drop in temperature, etc.), or the nature of the response (ex. whether the adrenal cortex or the cardiovascular system was activated). But now it seems that stressful may depend on a whole range of ancillary circumstances. The response of a man to the adverse events depends on his experience. The response to a persistent or recurring stress may change with times as a consequence of alterations (‘transactions’) in relation between the individual and the stress or its source. The distinction between a ‘stressed’ and an unstressed individual is not absolute; indeed, it could be said that any living animal is always under some degree of stress in that it has to maintain its internal environment in the face of an external one with a very different composition, in order to compete with others for resources and to undergo periodic energetic demands such as those associated with reproduction.
Adaptations to Stress

Despite all these reservations and qualifications, it is important to understand how the body handles stress. This is an overwhelming evidence that persistent stress, particularly in those having difficulty in coping with it, is a major risk factor for a range of both somatic and psychological illnesses. Experimental evidence says that stress can alter gastric secretion and induce erosions which is consistent with clinical findings that gastric ulcers are associated with persistent stress. Exaggerated cardiovascular reactions to stress occur in some strains of rats. A parallel finding in man is that certain types of personality may also have a higher incidence of heart disease.

Dementia is characterized by a decrease in mental ability, particularly memory and judgement. Such people forget names, conversations or recent events and neglect personal hygiene, disregard social rules and experience other disruptive changes in their personality and behavior. It occurs mainly among elderly people.

Glue sniffing or solvent abuse is examples. Psychotic disorders are those in which hallucinations or delusions may be present as well as deranged and bizarre thoughts. The sufferer behaves strangely and is out of touch with reality. Schizophrenia is the commonest psychotic disorder.

A person suffers unpredictable disturbances in thinking mood, awareness and behavior which is meant as splitting of the mind. The word ‘schizophrenia’ means splitting of the mind.
In most cases, schizophrenia develops gradually. A schizophrenic patient's conversations become unusual and difficult to understand. They show inappropriate emotions, such as laughing at a sad story or becoming extremely angry or even violent without any obvious clue.

Some of them conversely have delusions (false beliefs) Ex. Patients with paranoid delusions imagine that other people are following them or trying to harm them some patients some has hallucinations. This is an imaginary voice. Which carry messages from important people or from god. And some of them move in unusual ways for Ex. When they talk, they may lift their feet too high and hold them up too long. Severe case of schizophrenia is called "catatonia". Precincts with bipolar disorder are also called manic depression.

Depressed people feel hopeless and worthless. Many suffer from insomnia and loss of appetite. Other symptoms include headaches, backaches, and chest pains. Some people with depression appear lethargic, they think and move slowly, but others display agitation. In many cases, the patient has difficulty on concentrating and may have terrifying and uncontrollable thoughts. And some attempt, suicide because they believe they have no reason to continue living. As they view suicide as an escape from their problems.

Depression is classified as major depression (psychotic depression) and minor depression (neurotic depression).

A person with mania feels alert, optimistic and over confident but these feelings may suddenly change to irritability or rage. The mind jumps from one thought to another and the individual speaks in a rambling and uncontrollable
manner. People with mania move quickly, work energetically at the same time they sometimes need little sleep. They move restlessly from project to project but seldom complete any particular task. Most periods of mania begin suddenly, and then end abruptly.

![Diagram of Kinds of Mental Illnesses]

**Fig 1.1 A model of Kinds of mental illnesses**

Anxiety and related disorders are mental disturbances in which a person experiences unreasonable fears.

The five chief types of anxiety disorders are

1) Generalized anxiety

2) Phobias

3) Panic disorder

4) Obsessive compulsive disorder and

5) Dissociative disorder.
Generalized anxiety is a persistent fear without obvious cause which includes muscle tension, nausea, rapid heartbeat and hot or cold spells. The people who get this worry think that something terrible will happen to them. This makes them impatient and irritable and they often find it difficult to get along with other people. Phobias are persistent, strong fears of certain objects or situation. Common phobias include agoraphobia – fear of large open spaces and claustrophobia – fear of small enclosed spaces. A person suffering from phobia has a strong desire to avoid the dreaded object of the phobia, the individual may panic or become nauseated. Panic disorder is a sudden intense feeling of fear. Symptoms include shortness of breath, rapid heartbeat, and dizziness. Numbness, sweating and trembling in most causes, a fear of death accompanies these physical disturbances. This disorder occurs far more commonly in women than in men.

Obsessive-compulsive disorder is characterized by illogical and uncontrollable impulses that result in obsessions or compulsions. Obsessions are persistent terrible which cannot be ignored. Those who believe their actions will produce or prevent some feature events. The most obsessed involve thoughts in of committing violent acts or becoming contaminated. Compulsions are actions performed again and again with little purpose, such as repeated hand washing or counting objects. It causes increased tension, which immediately disappears after the action is performed. In severe cases, a compulsion prevents the individual from leading a normal life.
Dissociative disorders involve loss or change in identity. Psychogenic amnesia is a common dissociative disorder, in which a person forgets his or her past. Similarly in a disorder called psychogenic fugue, the individual not only forgets the past but also travels to a new location and assumes a new identity. The people who suffer from depersonalization disorder feel that they are watching themselves from a distance and have no control over their actions. In multiple personality disorder, the individual has two or more distinct personalities, each of which dominates at certain times.

Disorders of vegetative functions are disturbance of appetite like anorexia bulimia, sexual drive like insomnia hypersonnia or performance and sleep.

Personality disorders are character traits that create difficulties in personal relationships. Ex. anti social personality disorder’ is characterized by aggressive and harmful behavior that occurs before the age of 15. Such behavior includes lying, stealing, fighting and resisting authority. During adulthood, people with this disorder often have difficulty keeping a job or accepting other responsibilities. Individuals with paranoid personality disorder are overly suspicious, cautious and secretive. They may have delusions that, people are watching them or talking about them. They often criticize others but feel difficult in accepting criticism.

People who suffer from compulsive personality disorder attach great importance to organization. They strive for efficiency and may spend a great deal of time making lists and schedules. At the same time they are indecisive.
and seldom accomplish anything they set out to do and often make unreasonable demands on other people and face difficulty in expressing emotions.

Stress induced disorders are those arising from traumatic events in a person’s life, such as bereavement or being involved in some major failure. Symptoms vary: anxiety and depression are common, and so are physical ailments, but exposure to major. Stress may also provoke confusion, hallucinations and mania.

Childhood mental disorder: Children may suffer from the same mental disorders that affect adults, sometimes these disorders produce difference symptoms in children. ex. A child with depression may demonstrate the depression by getting into trouble at school sometimes this illness generally occurs only in children. One such illness is ‘hyper kinetic disorder’ in which the child is disorganized and easily distracted. Children with this disorder suffer from ‘hyper activity’, a state of almost constant motion. These disturbances often cause learning difficulties at school and behavior problems both at school and at home.

A severe mental disorder called ‘infantile autism’ begins during early childhood. Children with this disorder fail to develop speech and other forms of communication. Autistic children appear detached and unresponsive. They usually stare vacant and they have no facial expression. Sometimes they attach
themselves strongly to specific objects and repeatedly perform rhythmic body movements such as hand clapping and rocking.

Research has shown that mental illnesses cause physical changes in the brain, resulting from illness or injury and some causes chemical imbalances in the brain and result in may cause other mental illness. Still other disorders are mainly due to environment which affect a person’s mental state. These conditions include unpleasant childhood experiences and severe emotional stress.

Physical changes in the structure of the brain may cause severe mental disorders including delirium and dementia. Brain damage may result in head injuries, infections or inherited defects. Diseases that damage or destroy brain tissue include encephalitis, meningitis and brain tumors. Besides a disease
called ‘arteriosclerosis’ (hardening of the arteries) may damage the brain by reducing its blood supply. This disease mainly attacks middle age and older people.

Chemical imbalances in the body may affect a person’s thoughts, feelings and behavior. It may cause schizophrenia and mania – depressive disorder. These chemicals called neurotransmitters’. People with schizophrenia may have a defect that causes brain cells to release abnormal amounts of one or more of these neurotransmitters dopamine, Noradrenalin and serotonin. A deficiency of these three chemicals may cause depression. Genetic factors, both schizophrenia and manic depressive disorder sometimes run in families. Studies suggest that this happens because children can inherit a tendency to develop the chemical imbalances involved in these disorders. However, environmental conditions generally determine whether a person with such an inherited tendency will actually become mentally ill. The only major disorder directly attributable to a genetic defect is Huntington’s disease. It plays some role in alcoholism and in some cases of Abyheimer’s disease. Childhood experiences that are unpleasant or disturbing may cause unconscious mental conflicts that affect a person throughout his life. It involves family problems, relationships with other children, or difficulties in school. Many psychiatrists believe that adults who are over protected are subjected more to mental illness because they never learnt how to deal their problems. Emotional stress may become so severe when a person is unable ability to handle everyday problems
such as overwork, poor health, financial problems or family responsibilities. If stress becomes overwhelming, a person may reach the “breaking point” and become mentally ill. The ability to deal with stress depends greatly on a person’s physical condition, past experiences and current problems.

1.4 NEUROCHEMISTRY AND PHYSIOLOGY

The neurochemistry of the general adaptation syndrome is understandable. Although much remains are to be discovered about how this system of how it has an effect upon others in the brain and elsewhere in the body.

The body reacts to stress first by releasing the Catecholamine hormones, Epinephrine and Nerepinephrine, and the glucocorticoids hormones Cortisol and Cortisone. The Hypothalamic-Pituitary-Adrenal (HPA) axis is a major part of the Neuroendocrine, system, involving the interactions of the Hypothalamus, the Pituitary gland and the Adrenal glands. Besides, this axis is believed to play a primary role in the body’s reactions to stress, by balancing hormone release from the Adrenaline producing Adrenal Medulla and Adrenal Cortex from Corticosteroid.

Folklore of Stress

About the time of Selye’s accomplishment, the gradual realization dawned that such concepts such as anxiety, antagonism, exhaustion, frustration, distress, despair, overwork pre-menstrual tension, over-focus confusion,
mournings and fear could all be arrived at a general broadening of the meaning of the term stress [101]. The popular use of the term in modern folklore expanded rapidly, by generating an industry of popular psychology, self help personal counseling, and sometimes a false claim.

The use of the term stress in serious recognized cases such as those of post traumatic stress disorder and psychosomatic illness has scarcely helped clear analysis of the generalized “stress” phenomenon. Nevertheless, some varieties of stress from negative life events, or distress, and from positive life events, or eustress can clearly have a serious physical impact distinct from the troubles of what psychotherapists call the “worried well”.

Stress activates the sympathetic nervous system and releases stress hormones including Adrenaline Epinephrine and Cortisol. Sympathetic nervous output tends to divert blood flow to the large muscles of the body ‘thinks’ it has to run away from something or fight something that called fight/fright syndrome of ancient evolutionary heritage. As a result, of this the blood flow is correspondingly less to the bowel and other non-muscle organs. We all recognize the effects of dry mouth, motor agitation, sweating, pallor, enlarged pupils and insomnia. Our modern lifestyle tends to cause continual sympathetic nervous system activation with very little opportunity for the parasympathetic (also called ‘vegetative’) nervous system to activate. When this system is active, the bowel and other non-muscle organs receive good blood-flow, the pupils contract, and all the glands function well and secrete their various compounds. But absence of parasympathetic activation leads to poor digestion
and probably to poor healing and organ function. It is essential to take time out from our modern lifestyles to allow for rest and proper parasympathetic action in our bodies.

Perspectives on Social Stress

Modern medicine has relatively little interest in cognitive functions, psychological techniques, or the effect of nuances of belief, faith, self-suggestion, or yogic exercises on internal functions in treatment regimes. On the other side of the therapeutic coin, psychology has fostered a few formal applications for medicine. There are, however, emerging notions of the cause and treatment of emotional, psychosomatic, and related problems, now popularly designated as stress-related problems, that are directed toward both psycho physiological relationships in health and illness and the influences of higher order mental functions. Theorists have offered unifying concepts, but still the relationships between psychosocial causes and psycho physiological effects are increasingly assumed and experimentally supported, little in the way of unifying concepts. The bioscientific isolationism between psychology and medicine has been greater to make their respective research and approaches mutually exclusive in theory if not in practice.

1.5 CURRENT CONCEPTS OF PSYCHOSOCIAL STRESS

Although research and clinical opinions about stress problems of psychosocial origin is undergoing revision most of the evidence and concepts
are derived from three peculiar segregated disciplines. Those disciplines are psychology, psychophysiology, and psychosomatic medicine. Each of these is related but separate and unconsolidated specialties are subscribed to the same two principles. Initially in general if human emotions are inappropriately or inadequately expressed, tension occurs, resulting in either emotional or psychosomatic disorders and secondly, the implementing mechanisms involve general or selective activation of aspects of neurophysiologic, neuroendocrine, or immune system. The three disciplines, however, deal with quite different aspects of psycho physiological relationships on both conceptual and practical levels. Psychology concentrates on subjective factors of emotion, were as psychophysiology medicine concentrates on psychosocial factors which is related to specific psychosomatic disorders.

They generally begin with the assumption that environmental situations activate the physiological mechanisms manifesting the signs and symptoms of stress disorders, and do not deal with the emotions activating factors.

In attempts to organize the source of human stress, the general class is usually designated as environmental stress with subclasses of psychological stress (Ex loss of love, unconscious conflicts), social stress (Ex, cultural restrictions, technological change), economic stress (unemployment, poverty), and physiological stress (physical, chemical, bacteriological). This classification scheme catalogs the possible sources of stress and does not attempt to identify the nature of stress. Current evidence for common mechanisms of the multiple varieties of stress which are to related disturbances
suggests that a more exact, prognostic classification would be more helpful in understanding the stress process.

1.6 OPERATIONAL CLASSIFICATION OF STRESS

<table>
<thead>
<tr>
<th>System</th>
<th>External force (stressor)</th>
<th>Response</th>
<th>Internal Mechanisms (Producing Distress)</th>
<th>Resisting Mechanisms (Adaptation)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Simple inorganic</td>
<td>Physical (pressure) heat, cold</td>
<td>Strain (change in shape structure)</td>
<td>Inorganic elements molecules</td>
<td>Opposite force</td>
</tr>
<tr>
<td>Low organic (bacteria plants)</td>
<td>Physical</td>
<td>Change in shape, structure direction, or location</td>
<td>Ion exchange, simple reflexes</td>
<td>Secretions, regeneration inclusion</td>
</tr>
<tr>
<td>Higher animals (primitive man)</td>
<td>Physical: threats to physical well being, threats to group</td>
<td>Local and general physical arousal, fight-or-flight aggregation</td>
<td>Interaction neural networks, specialized organs, fostering system</td>
<td>Coordinated neural and hormonal system, primitive control of external sources</td>
</tr>
<tr>
<td>Socialized man</td>
<td>Predominantly nonphysical, threats to social well-being and survival intellectual pressure</td>
<td>Primarily intellectual, emotional perceptual change of consciousness secondarily, physiological arousal</td>
<td>Higher-order brain functions, abstract thought ability to order and to project language</td>
<td>Awareness. Understanding, social coping, exploring resources and alternatives securing relevant information</td>
</tr>
</tbody>
</table>

Fig 1.3

Lists of the major categories of stress systems
The above given table lists the major categories of stress systems, the several elements implied by the general concept and examples of stress in order to increase complexity, systems subject to stress may be physical, physiological, and nonphysical with both subjective and physiological expression.

The elements implied are:

1. The system involved.
2. The nature of the external force.
3. The response.
4. The mechanisms involved in producing the response.
5. The mechanisms involved in resisting the external force.

The nature of stress for simple inorganic system can be easily described. Even the stress reactions of animal physiological systems are also well understood from the work of Cannon [22] and of Selye [102] who have documented the physiological and biochemical response to direct and imminent physical stress. Beyond this, difficulties arise when the concept of stress is applied to phycogenetical higher animals and to the complex system of modern man. Some Psychological and Physiological Disturbances are believed to be caused by Related to or aggravated by Psychosocial Stress;
The (Causes) problems of stress are mentioned below:

**Emotional**: Anxiety, insomnia, tension headaches, again, sexual impotency, neuroses, phobias alcoholism, drug abuse, learning problems general malaise.

**Psychosomatic**: Essential hypertension, auricular arrhythmias, Ulcers, colitis, asthma, chronic pain, acne, and peripheral vascular disease.

**Organic**: Triggered by stress, epilepsy, migraine, herpes, angina, coronary thrombosis, and rheumatoid arthritis.

Psychological Adjustment problems (example):

Anxiety of classroom learning (moderate interference in satisfying fulfilling human potential)

Sociological problems (example):

Chronic unemployment, delinquency (Socially undesirable, socioeconomic impoverishment and instability)

Aggravated or prolonged distress in illness of any origin:

This syndrome encompasses all the personal emotional activities pertained to social stress reactions, further it occupies the dominant role of cognitive activity. Worry includes both conscious and unconscious worry. It is made up of the well known elements of apprehension, anxiety, insecure feelings, uncertainty, inadequacy, conflict, frustration, etc. and other related
emotions. All these expressions of personal emotion are rooted in an intellectual concern about social activity.

1.7 GENERAL COGNITIVE MEASURES MODIFYING THE COGNITIVE DEFECTS IN SOCIAL STRESS REACTIONS

If the cognitive processing scheme outlined has validity, it should enable us to identify areas of defective function in order to suggest appropriate and effective treatment procedures. Both the processing and implementing phases of social stress reactions can be analyzed for specific defects that lead to problems and illness. The first defect is the lack of information about the cognitive intellectual processes to perceive the reality of social situations, relationships, and dynamics. The second defect is the lack of physiological proprioceptive information to regulate homeostatic systems.

Information about the social reality, the inappropriateness of certain emotional reactions, and social coping mechanisms can be supplied through a variety of sources such as psychotherapy, cognitive, therapies, such as counseling, meditation, and related techniques. To remedy the defect in recognizing body tensions and physiological reactions, information about the cause of it should be found out that is how and when the body is reacting to stress, inappropriateness of excessive body reactions, and about the discriminate productive from unproductive physiological activity. These caused can be supplied through techniques such as biofeedback, yoga, progressive
relaxation, autogenic training, imagery practice, and other body awareness techniques. Since the physiological and psychological reactions are actually concurrent, both psychosocial and physiological information in the treatment procedures might be expected to provide greater benefits than either alone.

![Blood pressure level](image)

*Fig 1.4 Blood pressure level*
1.8 PSYCHONEUROENDOCRINE APPROACHES TO THE STUDY OF STRESSFUL PERSON ENVIRONMENT TRANSACTIONS

Conceptual Frame and Research Strategy

Stress in this context, is regarded as a process of transactions between the individual and his environment, and hormonal measurements which are seen as tools. The key notion guiding our research[42] is that the effectiveness of psychosocial factors in arousing the Adrenal Medullary system which is determined by the individual’s cognitive appraisal of their meaning and the context in which the stimuli are embedded rather than by the physical properties of the stimuli [83].

Methodological Considerations

Research on the psychological significance of the Adrenal – Medullary hormones has been greatly facilitated by the development of fluorimetric techniques for estimating free Catecholamine’s in urine, with the result that relevant date can be obtained by sampling urine while persons are engaged in their ordinary daily activities. At first VonEuler and Lundberg, demonstrated and specified that these methods are well suited to the study of psychological influences in everyday life. Only a small fraction shows a high degree of intra individual constancy a comprehensive review of Adrenal-Medullary secretion and its neural control. Levi gives a detailed review of sources of error in Urinary Catecholamine measurement,

  e.g. dietary and chemical factors, is given by
The conditions under which urine is sampled are carefully standardized, Catecholamine excretion rates constitute sensitive indices of the psychological impact of the environment.

**Manipulating Controllability**

The possibility of exercising situational control is recognized as a major decisive factor of the stressfulness of a person’s environment transaction. Controllability facilitates adjustment and enhances coping effectiveness, although the effort involved in exerting control may be associated with temporary increase in arousal.

Conditions characterized by uncertainty, unpredictability, and lack of control usually produce a rise in adrenaline output. The influence of situational control on the Adrenal-Medullary response can be studied in laboratory experiments, designed to permit systematic variation of the uncertainty experienced by the subject. In one study [42] the subjects were given different degrees of Situational control in successive sessions. In the first session, high uncertainty was induced by telling the subject that each change in heart rate, which was recorded continuously, would automatically release an electric shock to his left hand. In actual fact, shocks were given according to a predetermined schedule. Under these conditions of high uncertainty, Adrenaline excretion rose from baseline level. In two subsequent sessions the subjects performed a choice-reaction task, where quick performance reduced the shock punishment, the last session was designed so that the subject exercised almost complete control, as shown in the bar diagram.
Mean excretion of adrenaline (dotted + open bars) and nor adrenaline (dotted bars) are expressed as percentages of baseline values, in laboratory situations where subjects experienced different degrees of uncertainty.

Adrenaline output decreased successively as uncertainty was reduced from a state of helplessness to an ability to master the disturbing influences. Nor adrenaline excretion, however, was not much affected. Although the ability to exert control counteracted the Adrenal Medullary response to uncertainty, but the level remained elevated, as one would expect during attention Demanding activity. It is also expected that these conditions would produce dissociation between Catecholamine and Cortisol secretion. The pituitary adrenal Cortisol System is particularly interesting in relation to the helplessness mastery dimension. Since it is highly susceptible to all aspects of control [83] typically, lack of control is accompanied by a pronounced increase of Cortisol secretion, whereas secretion may be suppressed in Conditions characterized by control and predictability.
Recent data from laboratory [42] illustrate the dissociation between the adrenal Medullary and the adrenal Cortisol response to an achievement situation characterized by Feelings of complete mastery, safely, and Control (by the after bar diagram).

Exp, Score of baseline (log scale)

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**Fig 1.6**

*Mean changes (log scale) from baseline level in mood variables (upper diagram) and Physiological variables (lower diagram) in an achievement situation is characterized by High control ability and “confident task involvement”.*
This was attained by giving each participant a careful designed preparatory period, which was encouraged to try out different stimulus rates on a choice reaction Task in order to arrive at his own “preferred work pace”. The task proper did not begin until the subject felt confident about the pace at which a period of sustained work is to begin every five minutes an opportunity was given to modify the stimulus rate so as to maintain an optimal work pace. Hence the situation was both predictable and controllable arrangements were successful in creating an atmosphere that was both pleasant and stimulating, providing excellent possibilities for sustained work. Under these conditions of “Confident task involvement”, Cortisol showed a tendency to decrease to a level below the baseline. In contrast, adrenaline showed the increase typical of this hormone in situations requiring effort and concentration.

In a recent study interest is focused on psychological and physiological effects of control over noise intensity in a situation where the subject performed mental arithmetic under over noise exposure. Every other subject was offered a choice between to submit it the same noise. An interesting feature of the results was that the participants tended to respond to the control versus no-control situation in accordance with their general expectations about control as assessed by the internal-external focus of control scale thus, for “internals” the increase from baseline was smaller (indicating a lower stress level) when they had control over noise intensity than when they did not, whereas for “externals” the pattern was reversed. If this appears the stress response to no controllable situations may be related to the extent to which
persons generally tend to perceive life events as lying beyond or within their sphere of influence.

Inter individual differences in the capacity to regulate Catecholamine release to suit environmental demands may account, for differences in the ability to tolerate conditions characterized by low and high stimulus loads. The "Paradoxical" reaction for a decrease of adrenal secretion is evoked by a stressor can be an example for adaptive failure. This phenomenon observed from time to time in apparently health subjects, probably reflects a denial of environmental demands.

We do not yet understand the precise mechanisms by which circulating catecholamine modify mental capacity. However, the available evidence does indicate that the catecholamine cross the blood grain barrier in some regions only but presumably penetrate sufficiently to exert a central effect. In addition the perception of the peripheral changes that accompany Catecholamine release may have an alerting effect.

An experimental finding states that those healthy individuals who have more adrenaline secretion tend to cope better with both cognitive and emotional stresses, raises the question of possible long-term effects of adrenaline-mediated adjustment to the psychosocial environment. There is no direct evidence of a causal relationship between Catecholamine and disease. Data from several sources suggest that increased Catecholamine secretion is potentially dangerous. If it lasts too long or is repeated too often, it may cause
functional disturbances in various organs and organ system, which, may lead to disease.

1.9 BIOLOGICAL TRADITION

Medical interest in stress can be traced back to antiquity, its modern roots begin Cannon’s [22] work on emotional stress. He considered stress and its “emergency response” to be adaptive in that they prepared the individual to cope with danger. Recognition of danger was followed by adrenal gland activity (most notably the secretion of epinephrine) and sympathetic arousal that increased heart rate respiration and skeletal muscle tone while reducing blood flow to the skin and viscera by being a state of heightened arousal, the individual could more easily fight or flight from the danger. Stress was viewed as a response to threat that was directly related to survival and adaptation.

Though Cannon’s [22] work is very important in understanding stress, work by Selye [101] reflects the primary popular view of stress research in the biological community. Selye found that triad of physiological effects accompanied a wide range of different noxious agents that were administered to laboratory animals, be the injections of hormone extracts or applications of irritants or heart. This triad consisted of shrinkage of the thymus gland, enlargement of the adrenal gland, and ulceration, in the gastrointestinal tract. The interesting aspect of this syndrome was that it was nonspecific all aversive stimuli caused the same way. Selye went on to propose a theory centered around the general adaptation syndrome, a three-stage process that describes
how stress affects the organism. The first stage of the process is alarm, in which the organism is mobilized to combat the physical demands of the stressor. The second stage is resistance, in which the organism appears to hold its own against the still present threat. The third stage is exhaustion. Though there may be no immediately obvious change in environmental conditions, the organism seemingly gives up, and the collapse often results in death. Presumably this only occurs when the threats persist or repeat often enough to overwhelm the organism’s ability to resist. The presumed mediator between the threat reaction and physiological consequences are the corticosteroids most notably Cortisol (or its nonhuman analogues, such as Corticosterone).

Selye [101] has developed an elaborate theory of stress with several implications. First, the implication of this theory is that the effects of stress are cumulative. That is, the damage produced by stressors accumulates over time. Second, these effects are involved in serious pathology when they overwhelm one’s ability to cope. Third, stress may be additive because response to different threats are the same. Individual reaction to a threat will be augmented or added to his or her reaction to the previous exposure to threats.

Others have also contributed to research on physiological aspects of stress. Manson [83] has argued against a nonspecific model of stress showing that the endocrine system exhibits different patterns of response to different threats. Research showed, for example that reaction to uncertainty or ambiguity was associated with increase in Catecholamine (norepinephrine and epinephrine) and Cortisol, whereas more focused anger or fear was
associative with increase only norepinephrine and Manson pointed out that all of these response are integrated by the central nervous system and are therefore mediated by psychological recognition of danger.

Manson’s work represents an integration of biological and psychosocial approaches in stress. In a series of studies with animals, he was able to show that awareness of threats or harm seemed necessary for stress responding to occur however, implicit links to the psychosocial literature were not drawn.

1.10 Psychosocial Tradition

In addition to the biological tradition, there is psychosocial perspective on the study of stress. This perspective has generated a stream of research that is usually independent of physiological studies. In this view, stress is the reaction of an organism to demand plan upon it. The key focus within this rather broad perspective is upon healthy, usually normal humans and nonphysical stressors. Most psychosocial studies are concerned with none latest noninvasive stressors and only rarely are morphological changes studied. The emphasis is on the interaction of stressful agents and the human system of appraisal and evaluation. At the extreme, this would suggest that nothing stressful unless the Individual defines it as such that is the physical characteristics of the stressor are of minimal or negligible importance related to the human evaluation of the threat that impose pose. No events re universally stressful, for instance, one standard stressor in laboratory human experiments is the cold presser test hard or a foot is placed in a bucket containing a mixture of ice and water at about 4c
and kept there for about two minutes. This pressure generates stress. Stress may only exist when the person undergoing it defines it as such. Is crowding stressful? Ex. the answer may depend on whether the people on a crowded commuter bus traveling to tedious and unpleasant jobs or jammed in the backset of a car going on vacation.

A research example of this conception of stress is provided by classic work by Lazarus and his colleagues specimen, Lazarus, Davison volunteers were shown Threat and anxiety including movies, including a film of aboriginal sub incision rites (adult circumcision by means of stone age implement) and a safety film, in which various power tool mishaps and injuries mostly to limbs and tinkers, were shown. A number of different measures of distress and psycho physiological response were recorded. The magnitude of these responses and the stress they indexed depended upon the sound track and the viewing instructions. Some sound tracks encouraged no threatening appraisals of the films (ex. “These are actors, they are not really being harmed”) whereas other sound tracks encouraged threatening appraisals. These “sets” and the perspectives into which the film were not determined whether or not the subjects were stressed by viewing them. The film stressor itself elicited a universal reaction. The later studies by other investigator have measured Neuroendocrine correlated of similar sorts of stressor, and these measures also appear to be related to appraisal of stressful event.

Emphasis on appraised is consistent with work and suggest that integrated patterns of psychological and biological responses to situational
demands characterize the process of stress. Studies about stress among people living near the mile Island Nuclear power station (TMI) provide an example overall. We have found that TMI area student (people living within 5 miles of the damaged reactor) exhibited greater emotional, stress and task performance decrement lower levels of urinary Catecholamine and higher blood pressures than did subjects drawn than several control locations more than a wear after the TMI accident differences that we observed were modest and the correlations among the different measures were reasonable which suggest that there was partial overlap in measures of psychological and physiological response. More important, we found that some TMI area residents were consistently high on all of this stress measure was and others were consistently low. These differences in response were in turn related to several variables that influence appraisal or reflect its outcome. Perceptions of control and social support, selection of specific modes of coping, and attribution of responsibility were associated with stress among TMI area residents across several different types of measures.

The notion of appraisal is a central component of most psychosocial research on stress. For the most part, emphasis has been on mediating conditions and constructs that intervene between events and appraisal of them. Appraisal is also important in coping; selection of responses is facilitated by evaluation of probable outcomes, available options, and soon. It is important to note that may have direct effects if physical stressors that are not necessarily affected by appraisal. Appraisals may increase or decrease the immediate
effects or stressors but do not elevate direct physical effects. This is evident in studies of noise stress, in which various cognitive factors affect annoyance irritation but, regardless of appraisal excessive noise levels may cause hearing loss or physical damage. Similarly, a smoker may deny that cigarettes have negative health consequences and thereby reduce distress or worry associated with his or her habit. But the physical damage associated with smoking continues independently of this appraisal. Although appraisal is important, there may be direct physical effects of a stressor that occur regardless of appraisal outcome.

Folkman’s review considers many of these points in greater detail. It is sufficient to recognize the potential importance of appraisal as well as interaction that must occur between physiological and psychological aspects of stress.
Fig 1.7

Mean values for heart rate, systolic and diastolic blood pressure (A) estimates of subjective stress (B) and performance in a concentration task (C) during infusions of a placebo solution and four doses of epinephrine (adrenaline).
1.11 THE IMMUNE SYSTEM AND THE BRAIN

Dr. Sternberg [122] likens the immune system to soldiers moving into battle, each kind with its own specialized function. Some are like garbage collectors; ingesting invaders. Some make antibodies, the “bullets” to fight the infectious against; others kill invaders directly. All these types of immune cells must coordinate their actions, and the way they do that is by sending each other signals in the form of molecules that they make in factories inside the cell.

It turns out that these molecules have many more effects than just being the walkie-talkie communicators between different kinds of immune cells”, Dr. Sternberg

Dr. Sternberg explains that these immune molecules cause the brain to change its functions. “They can induce a whole set of behaviors that we call sickness behavior. If there is a loss of the desire or the ability to move there is a loss of appetite interest in sex.

Scientists can only speculate the purpose of these sickness behaviors, but Dr. Sternberg suggests that they might help us conserve energy when we are sick so we can better use our energy to fight disease.

These signaling molecules from the immune system can also activate the part of the brain that controls the stress response. The hypothalamus, though a cascade of hormones released from the pituitary and adrenal glands, the hypothalamus cause blood levels of the hormone Cortisol to rise. Cortisol is the major steroid hormone produced by our bodies to help us get through stressful situations. The related compound known as cortisone is widely used as an anti-
inflammatory drug in creams to treat rashes and in nasal sprays to treat Sinusitis and Asthma. But it wasn’t until very recently that scientist realized the brain also uses Cortisol to suppress the immune system and turn down inflammation within the body.

Stress and the Immune System

This complete communications cycle from the immune system to the brain and back again allows the immune system to talk to the brain, and the brain to then talk back and shut down the immune response when it’s no longer needed.

“When you think about this cross talk, the two-way street”, Dr. Sternberg [122] explains “You can begin to understand the kinds of illnesses that might result if there is either too much or too little communication in either direction”.

According to Dr. Sternberg, if a person is chronically suffering from stress, the part of the brain that controls the stress response is going to be constantly pumping out a lot of stress hormones. The immune cells are being bathed in molecules, which are essentially telling them to stop fighting. And so are situations of chronic stress the Immune cells are less able to respond to an invader like a bacteria or a virus. This theory holds up in studies looking at high-levels of shorter term stress or chronic stress: in caregivers like those talking care of relatives with Alzheimer’s Army rangers undergoing extremely grueling physical stress, and couples with martial stress.
The HPA axis is a feedback loop by which signals from the brain trigger the release of hormones needed to respond to stress, because of its function, the HPA axis also sometimes called the "Stress circuit". Briefly in response to a stress, the brain region known as the hypothalamus releases Corticotrophin Releasing Hormone (CRH). In turn, CRH acts on the pituitary gland, just beneath the brain, triggering the release of another Hormone, Adrenocorticopin (ACTH) into the bloodstream. Next, ACTH signals the adrenal glands, which sits atop the kidneys, to release a number of hormonal compounds. These compounds include Epinephrine (formerly known as Adrenaline) Norepinephrine (formerly known as Noradrenalin) and Cortisol. All three hormones enable in the body to respond to a threat. Epinephrine increases blood pressure and heart rate, diverts blood to the muscles, and speeds reaction time. Cortisol, also known as Glucocorticoids, releases sugar (in the form of glucose) from the body reserves so that this essential fuel can be used to power the muscles and the brain.

Normally, Cortisol also exerts a feedback effect to shut down the stress response after the threat has passed, acting upon the Hypothalamus and causing it to stop producing CRH.

This stress circuit affects systems throughout the body. The hormones of the HPA axis exert their effect on the autonomic nervous system. This controls such vital functions as heart rate, blood pressure, and digestion.

The HPA axis also communicates with several regions of the brain, including the limbic system, which controls motivation and mood, with the
The amygdale, which generates fear in response to danger, and with the hippocampus, which plays an important part in memory formation along with mood and motivation. In addition, the HPA axis is also connected with brain regions that control body temperature, suppress appetite, and control pain.

The HPA axis also interacts with various other glandular systems, among them those producing reproductive hormones, growth hormones, and thyroid hormones. Once activated, the stress response switches off the hormonal systems regulating growth, reproduction, metabolism, and immunity. Short term, the response is helpful, allowing us to divert biochemical resources to dealing with the threat.

**The Gastrointestinal Tract and Stress**

As many of us know, stress can also result in digestive problems. The stress circuit influences the stomach and intestines in several ways. First CRH directly hinders the release of Hydrochloric acid by Oxyntic cells and emptying of the stomach. Moreover, CRH also directly stimulates the colon, fastening the emptying of its contents. In addition to the effects of CRH alone on the stomach, the entire HPA axis through the autonomic nervous system, also hinders stomach acid secretion and emptying, as well as increasing the movement of the colon.

Also continual high levels of Cortisol as in depression or during chronic psychological stress can increase appetite and lead to weight gain. Rats given high doses of Cortisol for long periods had increased appetites and had larger
storage of abdominal fat. The rats also ate heavily when they would normally have been inactive. Overeating at night is also common among people who are under stress.

1.12 GENERAL ADAPTATION SYNDROME (G.A.S) SPELLS STRESS

With so many wondrous discoveries of science and medicine, it was by chance that Hungarian-born Han’s Selye (1907-1982) stumbled upon the idea of the General Adaptation Syndrome (G.A.S), which he first wrote about in the British Journal Nature in the summer of 1936 that G.A.S., alternately known as the stress syndrome, is what Selye came to call the process under which the body confronts “Stress” (what he first called “Noxious agents”). In G.A.S., Selye explained, the body passes through three universal stages of coping. First there is an “alarm reaction,” in which the body prepares itself for “fight or flight”. No organism can sustain this condition of excitement, however, and a second stage of adaptation ensues (provided the organism survives the first stage). In the second stage, a resistance to the stress is built. Finally, if the duration of the stress is sufficiently long, the body eventually enters a stage of exhaustion, a sort of aging “due to wear and tear”.

“Stress”, in Selye’s lexicon, could be anything from prolonged food deprivation to the injection of a foreign substance into the body, to a good muscular workout; by “stress”, he did not mean only “nervous stress”, but “the nonspecific response of the body to any demand”.

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Selye’s breakthrough ideas about stress helped to forge an entirely new medical field—the study of biological stress and its effects—which blossomed through the middle part of the twentieth century to include the work of thousands of researchers, and it is a science that continues to make advances today by connecting stress to illness and discovering new ways to help the body efficiently deal with life’s wear and tear.

Though his efforts were met with skepticism early on (he did suggest some fairly radical things, including the idea that stress had a causal relationship to a number of major illnesses—heart disease and cancer, among them), Selye’s impeccable methods and research gradually worn out, and his ideas were eventually treated with respect by health and science professionals of every stripe.

In Selye’s own words, his discovery was just “enough to prevent the concept from ever slipping through our fingers again; [making] it amenable to a precise scientific analysis”[101].

**The Unique View Afforded to the Young and Ignorant**

Selye, at this point, took two options. The first and most apparent was to give upon this line of research. There was plenty of reason to believe that this lagging behind would lead to unworthiness, and, he knew, many capable scientists had wasted their best years being led around by just such a red herring. “I became so depressed that for a few days I just sat in my laboratory”, he writes, “brooding about how this misadventure might have been avoided and wondering what was to be done now” [101].
The option he intended to choose was to devise some new way of examining his data.

Selye revisited a theory he first began to formulate years before at the German-speaking University of Prague, where, at the age of nineteen, he began medical school. It was here that Selye unintentionally developed ideas that lead to the discovery of the G.A.S.

Selye recalled years later that as the various patients were brought in and examined during his introduction to clinical medicine, they all “felt and looked ill, had a coated tongue, complained of more or less diffuse aches and pains in the joints, and of intestinal disturbances with loss of appetite”. They also generally “had fever, enlarged spleen or liver, inflamed tonsils, a skin rash” and a number of other general symptoms. It wouldn’t be until later that the tell tale signs would appear of, liver disease, and treatment could be recommended.

“Since these were my first patients,” Selye writes [102], “I was still capable of looking at them without being biased by current medical thought. Had I known more I would never have asked myself questions, because everything was handled just the way it should be.

The main question that stuck in Selye’s mind was a simple one really: how was it that doctors over the long history of medicine had spent so much time and energy on the discovery and treatment of individual diseases and had given so little thought to “the syndrome of just being sick”? Though captivated by this idea, being young and inexperienced-and working under the deadlines and demands of medical school-Selye hadn’t the time, energy or expertise to
pursue it. He briefly mentioned the idea to his advisor who promptly chuckled at the young man's inexperience, and thus the idea fell down for the better part of the next decade.

On "The Syndrome of Just Being Sick" And Bloodletting

The memory of the nonspecific illness did not altogether abandon Selye, though, and years later, when he was casting around for a rubric under which he could examine his failed hormone experiments, he was reminded of the symptoms of the patients in the Prague hospital. Those patients, he understood, shared something in common with his sick rats. His plan was to find out what that connection was, and he decided to devote his life to the discovery of the root of this nonspecific illness.

"If there was such a thing as a single nonspecific reaction of the body to damage of any kind", he writes of his jubilant epiphany, "this might be worth study for its own sake. Indeed, working out the mechanism of this kind of stereotyped syndrome of response to injury as such might be much more important to medicine than the discovery of yet another sex hormone"[101].

In piecing together the puzzle, Selye was aided by two other bits of medical knowledge. Certain treatments, he knew, were useful to patients suffering from just about anything. Doctors prescribed to most patients things like rest, eating easily digestible food and protection against great variations in temperature. Also, he recalled that there existed a number of nonspecific treatments in the history of medicine-and, in fact, in contemporary medicine,
too-that, though odd (some would say barbaric), had met with undeniable (if sporadic) success: practices like the injection of foreign substances into the body, fever therapy, shock therapy, and bloodletting.

It didn’t take long for Selye to formulate an idea that made all of this seemingly different information coalesce. There was some mechanism in the body, he rightly guessed, whose response to external agents—“noxious agents” was the best term he could then master. The Prague patients who suffered from just being sick, the shared symptoms in his experimental rats, the universal usage of certain treatments, as well as the successful practice of stressful remedies like shock therapy, when taken together, suggested that specific illnesses, if not wholly caused by a single influence, were certainly bound by similar forces; there was a link in the body’s reaction to illness that gave the appearance of some internal mechanism combating the stressing agents.

1.13 THE STRESS OF LIFE

The term “Stress” is so commonly used it seems to have lost significance as a specific diagnostic term. Everyone in our modern, fast-paced society seems to be “uptight” because their life is so stressful. The clinicians should never lose sight of the fact that body responds to all types of stress in a very specific manner.

In his seminars, we call attention to Hans Selye’s research on stress. Dr. Sternberg says that [122], Selye taught that the treating of one condition stress can result from a structural, nutritional, or emotional source. Regardless
of the source of stress, the body will react physiologically in an identical manner. It benefits us to know the exact manner of response, since failure to respond appropriately will result in symptoms. The goal of all the clinicians is determining the cause of symptoms.

Fortunately, Selye’s “The Stress of Life”[101] decided to study stress because in medical school he was impressed with the fact that most disease processes began with the same vague and undistinguished symptoms. Only after they became full blown disease processes could they be categorized, named, and treated with precise protocols.

Selye’s diagnostic plan

- Treat one condition, recognize the cause of the stress and make recommendations to reduce or eliminate it entirely.
- Take whatever therapeutic steps were necessary to relieve symptoms and restore normal function, and then make nutritional recommendations so the body could heal itself.
- That sounded like a plan to Selye that he could make work repeatedly and would be effective in most clinical cases. To say that I was encouraged would be an understatement.

He points out that the clinicians should not go directly from health to disease. Health is much more than the absence of symptoms. There is a long, grey area between the two extremes. Our goal is not to treat disease, but to prevent it. To prevent disease they must know what is normal and be able not just to see the deviations from normal, but also recognize what stresses
are challenging the body to remain within normal limits. Only if they recognize and reduce, or even eliminate, the major stresses on a specific body specialize in preventing disease is achieved. The sympathetic nervous system and blood glucose levels are key players in the body’s response to stress.

**Sympathetic Nervous System Response**

Obviously, the intention of the body’s response to stress is to permit the person to perform far more strenuous physical activity. Primary among the chain of sympathetic events is maintaining adequate blood glucose levels. To do this, the body kicks off an immediate hormonal cascade to switch from glucose to fat as the primary source of fuel for energy production. This involves the release of epinephrine from the adrenal glands, glucagon from the pancreas, and growth hormone. The sympathetic system is also strongly activated in many emotional states. For instance, in the state of rage (which is elicited mainly by stimulating the hypothalamus) signals are transmitted downward through the reticular formation and spinal cord to cause massive sympathetic discharge.

**Maintaining a Constant Blood Glucose Concentration**

The body has so many processes in place and devotes so much attention and energy to this issue, particularly since most tissues can shift to utilizing fats and proteins for energy in the absence of glucose. The reason is that glucose is
the only nutrient that can be supplied to the brain, retina and germinal epithelium of the gonads—in sufficient quantities—to supply them with their required energy from gluco between meals is used by brain. Indeed, it is important that the pancreas not secrete any insulin during this time because the small amount of available glucose would all go into muscles and other peripheral tissues, leaving the brain without a nutritive source.

1.14 CONCLUSION

Thus Dr. Sternberg’s views of stress, Hans Selye’s discoveries of science and medicine particularly about stress syndrome and others view about are all pointed out in this chapter.