CHAPTER - 2
REVIEW OF RELATED RESEARCH
CHAPTER 2
REVIEW OF RELATED RESEARCH

2.1 Stressor
2.2 Stress control
2.3 Stress reaction
2.4 Distress symptoms
2.5 Coping behaviour pattern
2.6 Stress and immune system
2.7 Stress and disease
2.8 Stress related disorders
2.9 Stress management approaches
2.9.1 Physical exercise
2.9.2 Relaxation training
2.9.3 Bio-feed back
2.9.4 Cognitive restructuring
2.9.5 Stress inoculation
2.9.6 Meditation
2.9.7 Drugs
2.10 Yoga
2.11 Yoga therapy and stress related diseases
2.12 Yoga practices and stress variables
2.13 Conceptual frame-work
2.14 Schematic diagram
REVIEW OF RELATED RESEARCH

In this chapter, a detailed review of literature available on various dimensions of stress and also the influence of stress on immune system and disease is presented. Research carried out on various stress management mechanisms like physical exercise, relaxation training, biofeedback, cognitive restructuring etc., is reviewed. Work done by different scholars in relation to the impact of drugs on stress management and the problems faced is also presented. Further in this chapter includes the review of studies on the efficacy of yoga on stress related diseases and the influence of yoga techniques on stress variables.

2.1 Stressor

An event or condition that may be purely physical, social, psychological including anticipation and imagination that triggers a stress reaction is referred to as a stressor. According to (Gindano & Everly, 1986) the stimulus that evokes a stress response is called stressor. A stimulus becomes a stressor by virtue of the fact that it has indeed endangered a stress response.

The results of a study conducted by Stokols et al., (1978) lend some support to the 'vicious cycle' position. The job, commuting, home, the economy and other events in a person's life are potentially interacting stressors and changes in any one of these can trigger stress provoking reactions in many other areas.
The environment in which the stressor occurs and the personal characteristics of the individual determine the extent to which any stressor elicits a stress response. McLean (1976) has labelled these two factors context and vulnerability. Context refers to the social and physical environment of the stressor which vulnerability refers to individual characteristics such as age, sex, personality traits and emotional predisposition.

Stressor events fall in two categories viz., 1) Psycho-Social Stressors and 2) Biogenic Stressors (Gindano & Everly, 1986). Psycho-Social stressors are either real or imaginary environmental events that 'set the stage' for the elicitation of stress response. They can not directly 'cause' the stress response but must work through cognitive appraisal mechanics. Most stressors are indeed psycho-social stressors. It is for this reason that one can argue that 'stress, like beauty, resides in the eye of the beholder'.

Biogenic stressor, however, are stressors that actually 'cause' the elicitation of the stress response. Such stimuli bypass the higher cognitive appraisal mechanisms and work directly on affective and neurologic triggering nuclei. Thus, by virtue of their biochemical properties, they directly initiate the stress response without the usual requisite cognitive-affective processing.
2.2 Stress Control

Stress control is primarily based on the cognitive appraisal, which refers to the process of cognitive interpretation; that is, the meaning that we assign to the world as it unfolds before us. According to Lazarus (1982) cognitive appraisal means that the way one interprets one’s plight at any given moment is crucial to emotional response (p. 1012). According to Ray, Lindop and Gibson (1992) "the cognitive perspective is the way in which a situation is perceived from the perspective of the individual's own history, values and expectations which are the central theoretical importance rather than the set of characteristics described to the situation on a consensual or normative basis. (pp. 387-389).

According to Lazarus (1977) "constantly thinking about the problem situations, worrying about them, even recapitulating situation will increase the negative affect associated with them. This cognitive inadequacy results in perceiving situations as threatening, demanding, harmful or stressful".

2.3 Stress reaction:

Stress reaction may be based up on the affective integration, which refers to the blending and colouring of felt emotions into the cognitive interpretation. Though cognition determines affect (felt emotion) and assumes a superordinate role in the process of restructuring human
behaviour pattern but according to Zajonc (1984, pp. 119-120) there are specific reasons for independency of affect:

1. Affective reactions show phylogenetic and ontogenetic primary.
2. Separate neuroanatomical structure can be indentified for affect and cognition.
3. Appraisal and affect are often uncorrelated and disjointed.
4. New affective can be established without an apparent participation of appraisal.
5. Affective states can be induced by non-cognitive and nonperceptual procedure.

In this study the cognitive and affective domain have been looked at from two different angles viz., stress control and stress reaction.

2.4 Stress symptoms

Distress symptoms are mainly caused by Target-Organ activation.

The target-organ activation as used in the present study refers to the phenomenon where the neural, neuroendocrine and endocrine constituents of stress response, just enumerated, either 1) activate, 2) increase or 3) inhibit normal activation in the human body.

Potential target-organ systems for stress include mental status, gastro-intestinal system, cardio-vascular system and musculoskeletal system. In the presence of
Finally distress becomes most outwardly apparent when it strikes the musculoskeletal system common signs of this kind of stress reaction are trembling fingers and hands, muscle twiching muscular tension or lightness, stammering or stuttering and any other difficulties in fine motor control.

2.5 Coping behaviour patterns

A major factor in determining the impact of stress on the human body is his or her perceived ability to cope.

According to Cohen & Lazarus (1979, p. 219) coping is "efforts, both action-oriented and intrapsychic to manage (that is to master, tolerate, reduce, minimise) environmental and internal demands and conflicts among them, which tax or exceed a person's resources. Coping can occur prior to a stressful confrontation in which case it is called anticipatory coping as well as in reaction to a present or past confrontation with harm.".

After a few years later, Lazarus & Folkman (1984 p. 141) defined coping as "constantly changing cognitive and behavioural efforts to manage specific...demands that are appraised as taxing or exceeding the resource of the person".

In the present study coping may be thought of as environmental or cognitive tactics to attenuate the stress response in the presence of unhappy events.
Coping may be problem oriented i.e., altering on-going situations or it may be affective oriented i.e., tackling the emotional arousal which leads to expression of felt emotions in the form of visceral activation and neuro-muscular activity.

Coping strategies:

According to Girando & Everly, (1986) "coping strategies can be either adaptive or maladaptive". To elaborate this concept further, according to Everly (1979), adaptive coping strategies reduce stress while at the same time promoting long term health (viz., exercise, relaxation, proper nutrition). Maladaptive coping strategies, on the other hand, do indeed reduce stress in the short term, but serve to erode health in the long term (viz., alcohol, smoking, interpersonal withdrawal).

2.6 Stress and immune system

Solomon George (1974) observes that during a stress reaction the body's natural immune system may be hampered in its defensive role so that various micro-organisms which would normally have been destroyed have chance to affect the body. Selye (1976) and Amkrant and soloman (1974) presented early reviews that support the conclusion that excessive stress can exert a generalised immuno-suppressive effect.
According to Naidu and Verma (1977) in a given situation it was assumed that a low stress tolerant would receive greater stress compared to a high stress tolerant. This assumption leads to the logical prediction faced with the same stressful situation that high stress tolerant would exhibit more problem solving response than low stress tolerants who show more defensive reactions.

2.7 **Stress and Disease**

Claude Bernard (1867) stated that the 'seeds of disease is all around and inside us all the time. The disease did not have an effect on one's body unless one's body was in a state to 'receive' one of them.

Brooke (1960) found that Arthritic patients tend to be domineering people and are often socially shy and express feeling in an aggressive way. Wolf (1968) has pointed out that Ulcer patients have lot of hostility in their systems which is blocked from expression by their need to be loved. They tend to get into marital troubles quite readily.

Henry and Stephens (1977) and Rabkin (1982) conclude that acute and chronic stress can result in anxiety reaction which could result in depressive reactions and stress may be associated with schizophrenic relapse and subsequent hospitalisation.
Leahey (1964) stated that Cancer patients often led a life of loneliness and exhibit deep seated melancholy, despair, disappointment and hopelessness. Cancer often follows quickly after a severe disruption to or termination of crucial relationship.

Silverman (1968) concluded on the basis of his study that disease are induced or maintained by stress and they are not easily cured. As an example, thirty people in a study revealed that they had surgery done on their ulcer. Seventeen of them developed new ulcer, physical signs of anxiety and phobias, five had asthenic, four developed high blood pressure and one contracted T.B., within a year. There is no complete cure for disease where a major stress factor is involved.

Friedman & Roserman (1974), pointed out that stress related diseases have cluster of behavior characteristics which differentiates them from the others. For example, coronary prone people typically tend to be highly competitive and driven, they fall easily into conflict with authority figures and they are determined to out do their parents. Very active and energetic people tend to be coronary risks.

According to Lazarus (1977) it has been increasingly apparent that stress is an important factor in illness in general and in chronic illness in particular, many present
day illness can not be explained in terms of single 'cause'. Research suggest that a significant portion of the population seeking medical care is suffering from stress related diseases.

2.8 Stress related diseases

According to Mitelman & Wolf (1942), Wolf & Shepard, E.M. (1950), Mahl & Brody (1954) Peptic ulcer releases emotions of anger and rage due to increased secretion of acid and pepsin by stomach and that this secretion decreased with depression.

Studies conducted by Katri, Chan Souria and Udupa (1977) have shown that stress plays a vital role in the causation of cancer. Chaudari (1977) studied patients who complained of Amenorrhea and found that psychic stress such as other work, anxiety, change in dwelling or occupation and confinement were prime factors responsible for such a disorder. According to Ahmed and Rao (1977) starvation leads to stress which would increase adrenocortical secretions which in turn enhance the initiation and formation of gastric ulcers.

Kumar, Chandel, Singh and Pant (1977) noted that Stress caused diseases including thyrotoxicosis, hypertension, peptic ulcer, ulcerative colitis, bronchial asthma, rheumatoid arthritis and coronary heart diseases. Further,
diseases such as rheumatoid arthritis and ulcerative colitis are autoimmune diseases which are influenced by stress.

According to Sharma and Dubey (1977) stressful events like discomfort life situations, socio-cultural background, rapid modernisation and body type play a vital role in the occurrence of psychosomatic disorders.

According to Venkoba Rao and Nammalwar (1976) the clustering of life events like family and social relationship and occupation within a short period was significantly associated with the onset of depression.

It is evident from these studies that stress can cause a number of diseases to different organs and body systems.

2.9 Stress Management Approaches

2.9.1 Physical exercises

Chavat et al., (1964) Kravv & Raab (1961) have suggested that the "Wisdom of the body" dictates that the human stress response leads to physical exertion. Physical exercise appears to be the most effective way of expressing the stress response in a health promoting manner.

When stress response does not lead to physically active somatomotor expression, the risks of disease and dysfunction increase.
Based upon WHO's discussion, Chavat et al., (1964) concluded that when body is aroused for physical action but that physical expression is suppressed, a condition called psycho-physiological strain may be created due to overload.

According to Balog (1978), on completion of exercise, the organism may undergo psycho-physiological recovery by initiation of a trophotrophic response mediated by the parasympathetic nervous system which helps in arresting the arousal of stress.

Martin and Dubbert (1982) have suggested that regular aerobic exercise promotes improved psychological functioning as manifested by elevation of depressed mood, improved self-esteem, enhanced sense of control, reduction in anxiety.

Mecabe and Schneiderman (1984) conclude that circulating epinephrine represents the greatest risk to the integrity of heart muscles. The short term therapeutic mechanism associated with exercise entails the initiation of a state of relaxation following the physical activity clearly. Exercise itself represents powerful ergotropic response mediated by the sympathetic nervous system.

Haskell (1984) concludes that "Men who select a physically active life style, on their own, generally demonstrate fewer clinical manifestations of coronary heart disease (CHD) than their sedentary counterparts. When events occur they tend to be less severe during older age.
Long term effects

According to Layman (1977) that mechanism of action that support the use of exercise in the treatment and prevention of stress related disease represents a higher level of physical and psychological fitness and therefore a "higher level of stress resistance". The higher level to fitness may then aid the individual both psychologically and physically, in withstanding the injury effects of excessive stress. One might consider such a level of fitness as a 'Buffer' against excessive stress indeed.

Donoghue (1977) supports the relationship between chronic exercise and improved work performance. Jasnoski, Holmes, Soloman & Avlan (1981) found that in a ten week study, programmed exercise was found to be associated with an increase in self concept.

Kravv & Haab (1961), Layman (1977) and Sime's (1984) opined "if stress is defined in traditional fight - or - flight terminology, then exercise is a classic method of stress management through its active dynamic release of physiology preparedness; further, varied psychological perspectives for excessive stress (eg. poor self-esteem, hostility, poor body image) as well as varied characteristics that seem to prolong excessive stress (eg. anxiety, physiological reactivity depression, muscle tension) collectively, seem to be moved in a more healthy direction through a regular use of physical exercise."
2.9.2 Relaxation training

The relaxation is hypo-arousal state of psycho-physiological activity which mainly reduces general muscular activity, heart rate, respiration along with a feeling of comfort.

Leuner (1969), Sheehan (1972) have felt that mental imagery as a therapeutic intervention has a long and effective history for a wide range of clinical problems.

Benson (1975) concluded that relaxation response is useful in treating a wide variety of psychiatric and stress related somatic diseases. The important relaxation techniques adopted of late include:

1. Jacobson-progressive muscular relaxation and
2. Schultz and Luther "Autogenic training.

These two are widely used in stress related disturbances by reducing sympathetic nervous activity enhancing parasympathetic activity which are exactly opposite to the state of stress.

Borkovec, Grayson and Cooper (1980) concluded that frequent attempts to relax while focusing on internal sensations are sufficient to reduce tension. It has been known that muscle tension and anxiety can lead to stress, then if you can learn to reduce excessive muscle tension you will reduce excessive stress.
2.9.3 Bio-feed back

Dabake, B. (1977) described bio-feed back as an "interaction with interior self". Through such interactions, one learns to actually feel what he/she is thinking, influences body processes and the body processes influences thought process. The knowledge of the 'inner space' becomes more a part of the total thought and action process. Behaviour becomes more internally directed and less habitually conditioned to external forces. Here bio-feed back technique is based on the self awareness and self regulatory principle.

For this purpose mechanical monitors are used to identify and control biological based stress responses. Feedback can be provided usually either through auditory or visual mechanism. When a person is provided with these facilities, uncontrollable and unperceptable changes in heart rate, pulse beat, skin temperature and brain wave pattern can be identified through feedback monitor and also can be altered or controlled through relaxation, respiration or through thoughts and images.

2.9.4 Cognitive restructuring

The rational emotional therapy of Ellis (1971) is introduced as cognitive based therapy that can serve to alter dysfunctional cognition. The basic assumption is that the
individual who suffers from excessive stress may have a
albeit pathogenic to accept irrational or otherwise
inappropriate belief about important transactions. This
propensity can be corrected by treating the patient.

2.9.5 Stress inoculation

Epstein (1967) views that stress inoculation is a
natural healing process by which individuals maintain an
optimum rate of assimilation of stressful events.

Donald, M.J. (1983) stated that graded inoculation
approach towards stress prevention and treatment was offered
by one way to enable an individual to become more resistant
to stress and get prior experience with the stimulus
involved. The biological notion of immunisation is providing
a model that if an individual is given the opportunity to
deal with a stimulus that is mildly stressful and he is able
to tolerate similar stimulus of somewhat greater intensity in
the future. It would seem that one can affect an
individual’s tolerance of stress by manipulating his belief
about his performance in the situation and can control his
own behaviour. Any preparatory communication is said to
function as stress inoculation if it enables a person to
increase his or her tolerance of subsequent threatening
events as manifested by behaviour that is relatively
efficient and stable rather than disorganised by anxiety or
inappropriate as a result of real danger.
2.9.6 Meditation:

Nidich et al. (1973) have conducted a study and found that meditators were found to be significantly less anxious than non-meditators.

Schwartz (1973) reported that meditators had fewer psychosomatic disorders, more positive modes and are less neurotic.

Bhole M.V. (1983) in his study found out that yogic relaxation-cum-meditation for five minutes would help to overcome the emotional disturbances like anger, frustration etc.

2.9.7 Drugs:

A drug may be thought of as any chemical that interacts with a biological system. The major variety of drugs used to relieve the subjective state of distress described as tension or anxiety and reduce psychophysiological overactivity are the psychotrophic drugs.

A psychotrophic drug may be thought of as any drug that affect cognition, affect or perception, that is any drug that affects the psychological domain. Drug can play a useful role in treatment of the excessive stress by relieving distress symptoms.
According to Everly G.S. (1991) (p.258) the drugs that are commonly used to treat anxiety and stress-related syndromes are as follows:

Barbiturate and non-barbiturate sedative/hypnotics, which act at the brain stem to suppress all Cerebral. They include luminal, amytal, nembutal and seconal (barbiturate, doriden and quaalude (non-barbiturate).

Benzodiazepines, which have their locus of action within the limbic system. More specifically, they work by activating the GABA inhibitory neurotransmitter system within limbic circuitry. Although superior for anxiety, they possess addictive potentials and the possibility of abuse. Drugs like valium, librium, restoil and ativan are commonly prescribed benzodiazepines. A newer benzodiazepine, xanax, seems useful not only for anxiety but panic as well.

Antihistamines, beta blockers and even neuroleptics, which can be used for treatment of arousal syndromes.

Buspirone, the newest of the antianxiety drugs. Its mechanism is not clearly understood, but could be antidopaminergic.

Since drugs in effect mask symptoms rather than deal with primary causes of stress, they are not considered a long term solution. Additional problems associated with long term use include the real possibility of psychological dependency and/or physical addiction and also toxic manifestation.
2.10 Yoga

Yogendra (1947) in his observation has stated that positive emotional attitude, equanimity, poise and self-knowledge are the outcome of regular practice of yoga techniques.

Anand et al. (1961), it is observed that in the early 60's lot of research has gone into the investigation of yoga practices, influence on physiological correlates such as EEG pattern, circulatory, respiratory, autonomic, endocrine and neural activities. However, the attention on psychological parameters was limited.

Anand (1961) and Pratap (1978) have found that yoga relaxation and pranayama techniques are found to influence the physiological parameters, mainly enhancement of parasympathetic activity during shavasana.

Swami Saraswati 1975 stated that specific pranayama and relaxation (shavasana) techniques help to remove impurities in the blood vessels (Nadis) and dilate them and lower the peripheral resistance.

2.11 Yoga therapy and stress related diseases

Though, yoga has been practised in India for a number of centuries, its utility in controlling various stress diseases has been subjected to research only recently.
During the last three decades meditation has been considered as one of the most important effective forms of psycho-therapy. It is used in many psychiatric disorders, except in the cases of Schizophrenia, manic depressive psychosis and paranoia. The techniques suggested by Sahu (1956) and ranged for this purpose from Asana to Dhyana of the external and internal yoga.

Bhole M.V. (1976) has found that yogic treatment is quite successful in respect of Asthmatic cases with the help of yogic kriyas and relaxation.

Patel, V. of London and Datey K.K. (1969) have proved that practice of Shavasana, (a yogic relaxation) can effectively control hypertension and many other researchers also indicate that yoga techniques can be of great help in the state of anxiety and number of psychosomatic disorders including head-aches resulting from stress.

Udupa (1978) has studied catecholamines before and after 3 months of practice of shavasana and found reduction in catecholamines and blood pressure. In this study on 50 patients it was seen that adaphine and acidrix alone could not reduce blood pressure but along with shavasana even the doses could be reduced.

Bhole M.V. (1981) has also stated that yoga techniques could be utilized in the management of
psychosomatic disorders like Bronchial Asthma, Diabetes, obesity, constipation and chronic sinusites, Rhinitis, Headaches, hyperacidity and hypertension as they have psycho-physical base.

Gore M.M. (1988) in his study on the yogic treatment for diabetic mellitus found that yoga training could reduce the insuline doses to a great extent within two months. The relaxation aspect was more emphasised while treating the diabetes by using shavasana and reciting of Aum.

Udupa K.N. (1989) in his clinical studies prescribed yogic practices to patients with different types of stress disorders with due regard to their stage of psychic disturbances at the time of starting yogic practice. Most of the patients felt that there is lot of reduction in stress disorder.

2.12 Yoga practices and stress variables:

Kocher, H.C. (1971, 1972, 1976), in his different 3-week yoga training studies, observed that there is a significant reduction in total neurotic trend, decrease in emotional complexes and greater outlet of complex indicator, reduction in psycho-physiological disequilibrium. Significant reduction in general hostilities and total neurotism, anxiety level and general hostility after eight months training programme in yoga.
Moorthy & A. Metal (1978) conducted a "training in yoga for 3 weeks and found that yoga not only brought down higher level of cholesterol but also helped the individual to keep the cholesterol level within normal limits.

Paranjape, S.D. et al., (1979) in their study observed that the resting neuro-muscular activity was found to increase at the end of three months training in yogic physical culture as the subjects were practicing yoga mostly as physical exercise. At the end of six months the activity showed reduction as the students were corrected in this practice and more emphasis was laid on meditational aspect.

Oak, J.P. et al., (1981) in his study, found that a change in positive direction in factors like ego, weakness, guilt feeling, frustration and tension was seen in A.S.Q. studies whereas tender mindedness, submissiveness and anxiety factors were found to be reduced in M.S.Q. studies with yoga training.

Based on the research literature as reviewed above, it is obvious that stress can cause a number of diseases to various organs and bodily systems. Drugs may provide symptomatic relief rather than deal with primary cause of stress. In addition, there is a problem of psychological dependency, physical addiction and also toxic manifestation. Though non-pharmacological approaches like physical exercises, relaxation training and bio-feedback appear to be of some help but
they may not be able to manage the stress problem comprehensively.

As we have seen above, only a few studies had investigated the problem taking into account only a few psychological parameters relating to stress and stress related diseases by using yoga techniques. In addition, they are based on small sample and very few have dealt with control group. The other major lacuna in these studies refers to the non-coverage of yoga philosophy, yoga principles and yoga techniques, the combination of which, as discussed earlier, is important in effectively managing the stress.

2.13 Conceptual framework:

With a view to adequately addressing the above aspects and also analysing the process of stress response, a system model of the human stress response developed by Everly, G. (1991) (see appendix V) has been adopted with a few modifications in the present study. According to him the model which evolved in the recent past will assist in gaining a better understanding not only of the phenomenonology of human stress but its measurement and treatment as well.

Two stages were excluded in the above stated model, where stress response acts as a multi-dimensional interactive process and adopted in the present study to verify the impact
FIGURE 2.1: SCHEMATIC DIAGRAM SUMMARIZING THE MAIN STAGES INVOLVED IN STRESS MANAGEMENT THROUGH YOGA
of yoga. The reason for exclusion is that the stages presuppose the availability of technical support in terms of clinical laboratory, medical gadgets etc., which were not proposed to be used in this study. The two excluded stages include:

1. Neurologic triggering mechanisms (e.g., Locus Coeruleus, Limbic Neuclei, hypothalamic nuclei).
2. The stress response (a physiological mechanism of meditation).

2.14 Schematic diagram

As can be seen from the diagram (2.1), five components viz., 1) stressor event, 2) stress control (cognitive appraisal), 3) stress reaction (affective integration), 4) distress symptoms (target-organ activation) and 5) coping behaviour pattern summarise the main stages involved in the stress response and also the way in which the 'yoga package' serve as a multi-dimensional management system in the management of stress.