CHAPTER – II

REVIEW OF LITERATURE
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The purpose of this chapter is to present a fundamental understanding of the nature of occupational stress dynamics, the stress process and a theoretical background pertaining to coping with stress. Coping with work or occupational stress and the prevention of stress-related diseases has increasingly become the focus of occupational health specialists, organizations and industrial psychologists. Until recently, research regarding stress has primarily focused on the individual coping rather than the role of the work environment as a major source of stress for the employee (Rosen, 1996). The following section defines stress and examines the role of the work environment as a significant source of stress from a global scenario.

2.1. DEFINING STRESS

Man’s cave-dwelling ancestors faced different stress inducing stimuli than those faced by the individual today. Responding to dangerous animals or other life-threatening situations resulted in an attempt to ‘fight’ the cause of the threat or to flee. The bio-chemical and physical responses that took place in early mankind when faced with danger are the same type of physical responses experienced by modern man 25,000 years later (Matteson & Ivancevich, 1989). However, whilst the human nervous system is still responding in the same way to threatening stimuli or stressors, the modern ‘stressors’ including the environment have changed radically (Matteson & Ivancevich, 1989).

Stress is derived from the Latin word *stringere* meaning to draw tight and was used in the 17th century to describe hardships and strain. Earlier definitions of stress applied to physics and engineering, eventually influencing the concept of how stress affects individuals (Cartwright & Cooper, 2005). Levy and Wegman (1988) provide the following terms related to stress: Stress: A (perceived) substantial imbalance between demand and response capability under conditions where failure to meet demands has important perceived consequences.

*Stressor:* Environmental event, situation, or condition that results in stress

*Stressful:* Pertaining to an environment that has many stressors
**Strain:** short-term physiological, psychological or behavioural manifestations of stress (p.298).

Hans Selye (1976)⁵ and Richard Lazarus are amongst the earlier pioneers relating to theories of stress. In the earlier work of Selye (1976) stress is defined as: “the nonspecific responses of the body to any demand” (p.15). In the classical work of Lazarus (1966) stress is defined as: “A stimulus condition that results in a form of disequilibrium in the system, producing a kind of strain and changes in the system. Psychological stress, a threat or anticipation of a future confrontation with harm, based on cues which are appraised by cognitive processes”(p.17).

Krantz, Grunberg and Baum (1985)⁶ view stressors as a stimulus that makes demands on an organism which has to adapt or adjust to the stimuli. Schlebusch (2000), states that an event or ‘stimuli’ becomes stressful only if the individual interprets it as such. The stimuli comprise of both positive and negative experiences, with both types of experiences resulting in changes of a biological nature within the individual. Thus not all stress is perceived as negative. Strumpfer (1983)⁷ distinguishes between ‘good’ and ‘bad’ stress. Distress or ‘bad’ stress refers to harmful, unpleasant demands on the individual. Strumpfer refers to ‘positive’ stress which is described as ‘eustress’ and is derived from the Greek word ‘eu’ meaning good. Eustress denotes a pleasant and facilitating form of stress and can be exemplified in the employee who thrives in a competitive or demanding work environment albeit stressful.

### 2.2. POSITIVE AND NEGATIVE STRESS

Strumpfer (1983) emphasizes that stress is necessary for functioning and should be accepted as part of life. The aforementioned definitions suggest that stress is a psychological state derived from the individual’s perception of the “threat” and his or her ability in dealing with the demands of the situation or environment. The stress-related situation or environment relates to the *source* of the stress. In his classical work, Lazarus (1966) suggested that the intensity and long-term ramifications of stress experienced by the individual is largely influenced by his or her perception of the *source* of the stressor. The occupational environment may be described as a potential ‘source’ of stress.
Matteson and Ivancevich (1989) state that there is an alarming increase in employees seeking compensation claims regarding damages suffered as a result of work stress, reinforcing that occupational stress is of growing concern to organisations around the world.

2.3. DEFINING OCCUPATIONAL STRESS

Collins (1990) defines occupation as “a person’s job or profession, any activity on which time is spent by a person” (p.583). In the light of the previous definition of stress, occupational stress relates to stress experience in one’s place of work, occupation or employment. The earlier work of Mc Lean (1974) defines job or occupational stress as “the condition in which some factor or combination of factors, at work interacts with the worker to disrupt his psychological or physiological homeostasis. The factor or combined factors at work are generally called job stressors and the disrupted homeostasis is often called job-strain” (p.15).

Levy and Wegman (1988) describe occupational stress as an occupational hazard depending on the nature of the work and or the perceptions and strength of the worker.

Selye’s (1976) definition of stress is viewed with criticism since it may prove useful in the general management of stress, but it is not useful in the evaluation of occupational stress, resulting in stress management programmes that aim at increasing adaptive resources as opposed to decreasing the causes of stress (Levy & Wegman, 1988). A broader understanding of the nature and ramifications of occupational stress is provided in the following discussion.

2.4. THE NATURE OF OCCUPATIONAL STRESS

The causes for increased occupational stress on a global scale are numerous. The aftermath of recessions, organizational mergers and acquisitions, retrenchments, increasing international competition and the relocations of roles and responsibilities amongst many other work related and global changes have been viewed as the main causes of stress in the modern world (Quick, Nelson & Hurrell, 2005). For the worker, occupational stress is primarily caused by the fundamentals of change, lack of
personal control, and high workload. Change is seen to be the byword of the new millennium, accompanied by job insecurities, corporate culture clashes, different styles of managerial leadership, fewer people performing increased work tasks, inevitably leading to increased stress levels (Cartwright & Cooper, 2005).^{11}

Kaban (2000) reports that according to the recent data published by International Labour Organization (ILO), one in every 10 office workers in US, Germany, Britain, Finland and Poland suffer from stress, anxiety, depression or burnout. Work related or occupational stress could thus be a larger threat to global productivity than AIDS by the year 2020 (Kaban, 2000). In the rapid pace of the individual’s lifestyle and the sophisticated technology modern man is constantly exposed to contribute to stress. Excessive stress has been linked to many kinds of illnesses from heart disease to cancer.

Bisseker (2006) states that stress-related illness emerging as the main ‘occupational disease’ of the modern workplace. Cartwright and Cooper (2005) report the collective cost of stress to the United States organizations for absenteeism, reduced productivity, compensation claims, health insurance, and medical expenses has been estimated at about $150 billion per year. Heart disease in industry has been recognized as the biggest killer with the British Heart Foundation reporting an estimated cost for British Companies with approximately 10,000 employees, experiencing an average of 73,000 lost their working days per annum (Cartwright & Cooper, 2005).

The British Heart Foundation further reports an average annual death of 42 employees between the age of 35-64 years and lost value of products or services of more than 2.5 million British pounds (Cartwright & Cooper, 2005). It is also reported that in the United Kingdom, 21% of all absence for sickness is due to stress-related heart disease (Cooper, Liukkonen & Cartwright, 1996). Heart disease in the United States of America causes an annual loss of 135 million per workdays, with one out of every five average male Americans likely to suffer a heart attack before the age of sixty-five (Robbins, 2003). Stress-related headaches are also the leading cause of lost working hours in United States industry (Robbins, 2003).^{14}
In India the economic burden of funding stress-related illnesses and disorders, for example depression, could run into billions of employees per annum (Bisseker, 2006). Evident from the statistics given in the aforementioned discussion, is the relation between occupational stress and the great percentage of stress-related diseases, with heart disease being a prime example. Stress remains central to the relationship between behaviour and health, since it aids in explaining how psychologically relevant ‘events’ translate into physiological changes that are both health-impairing and illness-related (Krantz, Grunberg & Baum, 1985). The ‘events’ the individual is exposed to generally represent the sources of stress. The following discussion details the sources of life and occupational stress.

2.4.1. SOURCES OF LIFE AND OCCUPATIONAL STRESS

A distinction needs to be made between the sources of life stress and the sources of occupational stress. The sources of life stress mainly relate to general events outside the working environment, whilst sources of occupational stress relate directly to the working environment.

2.4.1.1. SOURCES OF LIFE STRESS

Fisher and Reason (1988) indicate that there are four important types of stressors or sources of life stress, namely: Stressful life events, cataclysmic events, daily hassles and ambient stressors. Stressful life events may be classified as important transitions or changes that occur in the individual’s family, an example is the death of a spouse. Cataclysmic events are sudden and have devastating consequences, an example being an earthquake or a flood. Daily hassles are events that do not present extreme adaptive problems to the individual. Examples are the irritation experienced while waiting for a late train or commuting to and from work. Ambient stressors are continuously present in the environment of the individual, affecting his or her health since the individual may not experience any relief over a long period of time. Examples may be constant financial or health concerns.

Gatto (2003) and Yates (1979) distinguish between internal and external causes of stress. Both internal and external stressors may be experienced in or outside the occupational environment. The external stressors are seen to arise from various...
pressures and demands from the external environment – the family, work or friends are few examples. Internal stressors are the pressures the individual puts on him or herself, for example the endeavour to succeed at a specific work-related goal. The following section details the most significant sources of internal and external occupational stressors for the worker or employee.

2.4.1.2. SOURCES OF OCCUPATIONAL STRESS

Occupational stress theorists frequently emphasize the traditional occupational hazards found in many work environments namely, the physical, chemical or biological agents which could harm the individual. Thus many forms of stress experienced in the ‘occupational environment’ are related to external stressors which may be in the form of noxious stimuli, constant loud noise, exposure to noxious chemicals and microscopic organisms (for example, dangerous viruses) as found in hospitals, extreme heights, over-crowding, work entailing physical risk (for example, security protection relating to banking), lack of adequate lighting, dangerous machinery and precarious work conditions as found in underground mines. Other external factors could be a hostile work environment whereby change in the place of work has created inadequate social support, different reporting structures, lack of growth or promotional opportunities, loss of job security and lack of recognition. The literature discussing occupational stress (for example, Atkinson 1994; Matteson & Ivancevich, 1989; and Trauer, 1990) identify several sources of occupational stress namely: Task–based stress, role-based stress, environmental stress and social environmental stress. Task-based stress includes demands such as work overload or task complexity. Work overload poses two problems for the worker: there may be too much work (referred to as quantitative overload) or work that is too complex for the individual namely, qualitative overload (Cartwright & Cooper, 2005).

Argyle (2006) states that work overload may create health problems for workers, particularly during extended periods of ‘overload’ when employees have been found to drink and smoke more resulting in increased cholesterol and blood pressure levels.

Klarreich (1990) describes ‘work underload’ as an occupational stressor, which means that insufficient tasks for the worker may lead to boredom or frustration.
Role-based stress concerns the roles that the worker has to perform in the work-setting and includes role conflict and role ambiguity. Role conflict exists when the worker is torn between conflicting job demands, namely doing tasks that he or she dislikes or does not consider his or her responsibility. Role ambiguity arises when the individual does not have clarity as to the work objectives of the job with role conflict, role ambiguity and inadequate coping resources being the major contributing factors regarding stress-related disorders especially ‘burnout’ which is described as a progressive mental deterioration resulting in the individual becoming emotionally exhausted and depressed (Argyle, 2006; Klarreich, 1990). More women than men have been found to suffer from burnout in the workplace (Klarreich, 1990). According to Kablan (2000), a recent survey conducted by the International Labour Organization (ILO) reports that women suffer from more stress-related depression than men and that the main sources of stress were a lack of decision-making, unrealistic deadlines, isolated working conditions and inadequate child care arrangements. Not all studies indicate that women cope less positively with work stress than their male counterparts.

Parasuraman and Cleek (1984) investigated coping behaviours in managers relating to occupational role stressors. Questionnaires regarding occupational role stressors and coping styles were sent to a random sample of 300 managers. Of the respondents 54% were male and 46% were female. The findings indicated that women managers engage in more adaptive coping behaviours than their male counterparts, disconfirming previously held beliefs that female managers coped poorly with role pressures. Environmental stress pertains to the physical environment at the work-place.

Matteson and Ivancevich (1989) describe the physical environmental stressors as consisting of the physical ‘conditions’ in the work-place. An extreme of temperature is an example of an environmental stressor. Social environmental stressors relate to the kind of interpersonal relations or interpersonal dynamics that the worker experiences in the work setting. Social environmental stress may involve feeling isolated from other workers or experiencing a lack of privacy in the work setting.
In an earlier study conducted by Cooper and Marshall (1976)\textsuperscript{21} it is reported that the clerical, managerial and professional occupations have an increasing likelihood of occupational stress due to interpersonal dynamics rather than lack of physical activity at work. A recent survey conducted by management consultants in India found that the most common work stressors are interpersonal conflict, overwork, retrenchment, affirmative action and coping with changes in the work environment (Bisseker, 2006).

Kalimo, Batawi and Cooper (1987) emphasize social environmental factors as a significant source of potential occupational stress and refer to it as the ‘person environment fit’. The person-environment fit relates to the individual’s fulfillment of ‘psychological needs’ in order to do his or her work well within a specified occupational environment.

Trauer (1990)\textsuperscript{22} refers to the person-environment fit as the way in which the individual and the ‘environment fit together’ and states that stress arises from a mismatch between the worker and his occupational environment. A mismatch between the employee and his work environment mainly occurs when there is a conflict between the worker’s expectations, perception or ability regarding the actual demands of the job.

Keenan and Newton (1984)\textsuperscript{23} provide an example of a study pertaining to the ‘person-environment fit’. The study measured factors pertaining to work related environmental stress. The sample included 401 graduate engineers working in the engineering industry. Dependent variables were the anger reactions, latent hostility, job dissatisfaction and work related anxiety. Environmental stress was measured by using a questionnaire that consisted of items measuring emotional responses relating to the work environment. From the multiple regression analysis used, it was found that the organizational climate, role stress and social support contributed to the environmental frustration experienced by the engineers. The main areas associated with environmental frustration were role stress, organizational climate and social support. A limitation of the study was that the sample of engineers were all young, recently graduated with little, if not with any work experience in the industry.
Keenan and Newton (1984) acknowledge that it is not entirely certain that the findings of the study could be applicable to other groups of white-collar workers; however, the study does emphasize that environmental frustration as an important source of stress in the workplace. Included in the person-environment fit are the needs of the worker to have a satisfactory social interaction with other employees and a perception that his or her work is meaningful. Kalimo, et al. (1987) provide principal psycho-social characteristics presented in a work situation. Some of the main psychosocial characteristics are: challenge, pace control, task feedback, and skill adequacy. Challenge relates to the extent to which the worker’s skills and abilities are used. Pace control concerns the control that the worker has over the speed required for the task. Task feedback is the information that the worker receives from his supervisor or peers on how he or she is performing at work. Autonomy is the amount of freedom that the worker has in determining how the task will be completed and skill adequacy includes the training and competencies that the worker has in relation to the job demands.

Cartwright and Cooper (2005) include the following important sources of occupational stress: shift work, home versus work pressures and career development. Shift work has been shown to affect the health of workers, with long hours and extended shift times being linked to coronary heart disease and hypertension (Burns, 1988; Cartwright & Cooper, 2005). Shift work has also been related to psychosocial problems, especially in the form of social isolation due to the worker having to rest at times when his or her family may be involved in social activities (Ross & Altmaier, 1994). According to La Dou and Coleman (1994) studies report that women shift workers exhibit a higher incidence of nervous disorders and greater health problems than men, resulting in countries like Japan and Germany not allowing women to work on rotating shifts as a matter of national policy. Approximately 30% of Indian workers are involved in the mining, steel, service, petrochemical and manufacturing industries, with the result that the Indian economy relies heavily on the contribution of its shift-workers (Visser, 1999). In terms of home versus work pressures, fear of job loss, work overload and work related pressures have an impact on the families of employees. Managers may face the conflict between family responsibilities and work
demands, especially in their early career years. This could be in the form of longer hours at work, or job transfer or extended periods away from home. The dual-career family (where both husband and wife work) is a potential source of stress for men and women, especially if family expectations are in conflict with work demands.

Cartwright and Cooper (2005) state that in the United Kingdom, nearly 65% of all women work, mostly in full time jobs. Thus the responsibilities of child care and domestic chores either remain with the women or become a shared responsibility between husband and wife.

Matteson and Ivancevich (1989) state that the dual-career family requires flexibility, mutual commitment to both careers, mutual problem-solving and effective coping mechanisms. Unsatisfactory career development can be a source of stress for the employee. Lack of promotional opportunities and thwarted ambition are recognized as significant causes of job stress.

Cartwright and Cooper (2005) provide an important example, namely that employees facing middle age may find that their job security or career advancement is threatened by younger workers. A work environment that demands hard-driving individuals may act as a significant source of stress for an employee. However, certain individuals displaying Type A characteristics may be attracted to such a work environment regardless of the adverse health consequences. The following section discusses the role of personality in responding to stress and examines the physiological reactions to various sources of occupational stress.

2.4.1.3. SOURCES OF OCCUPATIONAL STRESS AND THE ROLE OF PERSONALITY

The manner in which occupational stress affects the individual has been related to the personality type of the individual. An example is given in Robbins (2003) which describes the research done by Friedman and Rosen pertaining to the Type A personality who is three times more likely to suffer from coronary heart disease than the Type B personality. The Type A person tends to be impatient and constantly strives to do as much as possible in the shortest period of time.
Atkinson (1994) refers to a ‘Type A working environment’ which encourages Type A behaviour whereby the employee is ‘expected’ to be hard-driven, ambitious and competitive. Atkinson (1994) indicates that the Type A working environment exposes the employee continuously to stress placing pressure on the individual to ‘become’ a Type A personality in order to keep his or her job.

Strumpfer (1983) states that Indian male managers, bankers and administrators show more type A behaviour than their international counterparts, with the incidence of coronary heart disease amongst White Indian men reporting to be among the highest in the world. Strumpfer (1983) contends that there could be a greater incidence of Type A behaviour amongst Indian men due to the shortage of higher-level human resources and the demands of the business sector to employ productive, hard-driving individuals. Contrary to previously held beliefs that the impatient, hard-driving individual is more susceptible to heart disease.

Robbins (2003) states that few evidence has linked mainly hostility and anger to heart disease, resulting in chronically angry and suspicious individuals being most at risk.

A gender study conducted by Frankenhaeuser (2001) investigated physiological and cardiac responses relating to various sources of occupational stress, namely: role conflict, social support, gender roles, work load, autonomy and control. The study was carried out at a Volvo plant in Gothenburg, Sweden. The investigation included an analysis of masculine and feminine personality traits and physiological stress responses in a sample of 60 employees aged between 30 and 50. There were four groups: 15 male managers and 15 female managers, 15 male clerks and 15 female clerks. All the subjects worked as full-time employees and were tested as being healthy and free from any medication. Smokers and diabetics were excluded from the study. Participants were married and only seven participants had no children, five of whom were female managers. Subjects were examined individually for 12 consecutive hours whilst working on a ‘normal’ day at the organisation. All subjects were interviewed in order to determine Type A characteristics. Questionnaires regarding coping and work stressors were also given to the subjects. Physiological tests included blood pressure examinations, blood lipid tests and the monitoring of heart rates. Urine samples were taken in order to determine the levels of cortisol and
cholamines. The subjects were also monitored in the same way whilst relaxing at home.

The findings of the Frankenhaeuser (2001) study revealed that of the four groups, the men managers reported the strongest conflict between role demands relating to work and family. The female managers presented high cholesterol levels, almost as high as the two male groups. Both gender groups reported work load stressors, deadlines and work pressure as very stressful. When under stress male managers did not reveal their feelings as much as the female managers did. The two gender groups did not differ significantly in terms of the autonomy experienced in the workplace. The female managers did not have a strong social support group. The female clerks however, had a strong social support group and reported to cope better with certain work stressors. The medical examinations of the Frankenhaeuser (2001) study revealed that the men had higher blood pressure levels than the women even when not at work. From the blood tests, it was found that when subjects were at home the norepinephrine levels increased in the women and decreased in the men, indicating that women experienced increased stress responses when in the home environment. The cholesterol tests reported that the women managers had significantly higher HDL cholesterol levels than the male managers regardless of occupational status. HDL cholesterol is thought to have protective properties in preventing heart disease whilst LDL cholesterol tends to increase the risk of heart disease (Frankenhaeuser, 2001). The results of the study also reported that Type A behaviour was also positively correlated with LDL cholesterol in men but not in women.

Frankenhaeuser (2001) posits that the study indicates that men and women tend to be equally reactive when subjected to acute stress situations. The findings reported that there are major gender differences in ‘stress exposure’, for example, the challenges and demands to which women and men are exposed to in the work environment. This finding should be interpreted with caution, in that the gender differences in ‘stress exposure’ may have been influenced by the different ‘direct’ work environments that the men and women were exposed to. The female managers and female clerks were all involved in administration or office work. The male managers and male ‘clerks’ worked mainly in the production, maintenance or
construction areas of the organization experiencing ‘factory related’ conditions. Thus
the male managers and workers may have experienced different sources of
environmental stress to that experienced by the female managers and workers
resulting in different ‘challenges or demands’ influencing the findings of the study.
Another limitation of the study is the small sample size; this also needs to be
considered when evaluating the findings. The limitations of the Frankenhaeuser
(2001) study has brought into question not only the reliability of empirical findings
cited in the literature pertaining to gender differences in coping with occupational
stress, but also the amount of research that has been conducted in this area.

Barnett, Biener and Baruch (1987)\textsuperscript{29} contend that previous stress-related
research has failed to include women, thus impairing the accuracy and
comprehensiveness of empirical findings in different ways, especially where the
findings taken from studies conducted on men are being incorrectly generalized to
women. Several authors for example, Barnett et al., 1987; Frankenhaeuser, 2001;
Haw, 1982; McDonald & Korabik 2001\textsuperscript{30} emphasize that studies pertaining to work-
related stress and coping have focused primarily on men and that a great deal of
research has failed to include gender as a variable.

Havlovic and Keenan (1995)\textsuperscript{31} contend that although gender has been
included in some coping related studies, the findings regarding coping differences in
men and women vary considerably. In summary, stress has been described as an
imbalance between stress-related demands and the coping resources of the individual.
Psychological stress is perceived as a ‘threat’ and without adequate coping
mechanism; the individual may experience a reduction in physical or psychological
well-being. Occupational stress has been recognised as a psychosocial phenomenon
with organisational and economical ramifications. There are several sources of
occupational stress, for example, role conflict, lack of career development, shift work
and social environmental stress. Studies (like, Frankenhaeuser, 2001) reveal that men
and women experience the sources of occupational stress in different ways, resulting
in different psychological and physiological responses. A great deal of previous stress
research has focused primarily on male workers, highlighting the need to include
gender as a variable in studies relating to occupational stress and coping. The effect of
stress is widely recognised in South African employment sectors. The following
discussion examines how occupational stress is viewed in an Indian context.

2.5. SOURCES OF OCCUPATIONAL STRESS IN AN INDIAN CONTEXT

As a result of the political transition over the last few years, particularly the
election of the Government of National Unity on 27 April 1994, Indians have been
exposed to constant changes, ideologically, politically and economically. These
changes have had a major impact on business organisations and government
organisations alike. Major changes in organisations are frequently referred to as a
‘change management’ process and it’s perceived as a significant source of
occupational stress in India (Marais, 2005).32

Marais (2005) investigated change management in the ‘New India’,
researching the impact of change on managers working for the National Parks Board.
The motivation for the research came as a result of the need to find ways in which to
assist managers to cope positively with the constant changes in the Indian workplace.
The method of research included interviews and six questionnaires based on the
salutogenic personality constructs of Antonovsky, Kobasa, Rotter, Ben-Sira,
Rosenbaum and Bandura in order to determine how a sample of 39 managers coped
with change. The results of the study revealed that within the sample population there
was a moderate to strong relationship between the strength of the salutogenic
construct scores and the ability of the managers to cope with change. The findings
also revealed that change in organizations may lead to increased anxiety, worry,
confusion and sadness in employees emphasizing that effective coping skills are
essential for managers in a rapidly changing work environment. One of the study’s
limitations was that it included a small sample of managers that were familiar with the
researcher in a working context. This factor may have influenced the way the subjects
responded to the interviews and the questionnaires.

Bisseker (2006) states that Indian occupational health and change management
consultants report that employees suffer from high levels of anxiety due to an increase
in corporate mergers, new technology, rationalisation and affirmative action.
Stress appears to be most prominent among middle managers who experience
pressures from both subordinates as well as company executives (Bisseker, 2006).
Indian managers also have to deal with increasing levels of violent crime and constant socio-economic change in addition to their usual occupational stressors thus exposing them to more stress than their North American and European counterparts (Bisseker, 2006). The sources of occupational stress from an Indian perspective include all the former factors mentioned in the literature.

According to Strumpfer (1983) managers in India face a history of inadequate education and a lack of exposure to cultural underpinnings that have previously assisted White children in their preparation for work in the labour market. Strumpfer (1983) reports that Black managers appointed as part of ‘black advancement’ programs frequently experience role ambiguity, role conflict and task under load. The new labour legislation recognises the impact of occupational sources of stress as having an adverse effect on employees if not monitored.

BCEA (2005) is described in Thomson and Benjamin (2005). The Act regulates the number of working hours and overtime in a given week. Employees performing regular night work are also protected by the Basic Conditions of Employment Act (2005) and it’s Code of Good Practice; Section 8 urges employers to identify the following health problems: any psychological, emotional and social stresses experienced by the employee. Section 8 of the BCEA (Thomson & Benjamin, 2005) further states that employers should assist employees to cope with night work and shift work by educating the staff and conducting regular medical tests in order to identify any health risks that may be associated with the employee’s work schedule. It is also recommended that employers provide assistance relating to coping strategies for their workers.

Section 9 of the BCEA (Thomson & Benjamin, 2005) includes the regulation of the work Environment pertaining to lighting, heating and factors adequate for the health and safety of employees, sufficient rest periods and counselling on health and nutritional matters particularly for shift and night workers.

The BCEA (Thomson & Benjamin, 2005) also urges employers to investigate health and stress related conditions like asthma, cardiac risk factors, hypertension, elevated cholesterol, depression, irritable bowel syndrome, peptic ulcers and weight
loss. Section 11 of the BCEA (Thomson & Benjamin, 2005) also makes provision for the employer to provide employees with information pertaining to coping strategies regarding night and shift work. Examples suggested ‘coping techniques’ are maintaining a healthy diet and ensuring regular relaxation and physical exercise.

With the implementation of the Employment Equity Bill (Thomson & Benjamin, 2005) which has enforced affirmative action, many managers and workers experience added stress as they face uncertainty pertaining to job security, promotion, role ambiguity and early retirement due to advancement programs. The Employment Equity Bill of 2005 (Thomson & Benjamin, 2005) also referred to as The Bill (2005), recognises the effects of discrimination against women in the labour market. The Bill (2005) seeks to eliminate unfair discrimination in employment, addressing issues like inequality in pay, lack of opportunities and the elimination of decisions based on prejudice and stereotyping. Gender and racial discrimination have been reported in the literature (for example, Barnett et. al, 1987) as a serious occupational stressor amongst men and women.

Cartwright and Cooper (2005) consider lack of promotional opportunity as a potential job stressor. In the justification preamble of The Bill’s enactment in 2005, mention is made that many employers have not promoted women believing that they are not assertive enough to supervise and manage staff. This observation written purposefully into the legislation highlights the differences in some of the possible sources of occupational stress faced by men and women. The following discussion examines this factor.

2.6. GENDER DIFFERENCES AS A SOURCE OF OCCUPATIONAL STRESS

The perceived differences amongst men and women in the workplace can create different sources of occupational stress for both men and women. How men and women are expected to behave or perform at work may be largely due to social expectations based on gender roles. An example of ‘gender related expectations’ would be to assume that male managers are more assertive (stronger leaders) than female managers and to assume that female managers are more nurturing and sensitive (better care-givers) than their male counterparts.
Levy and Wegman (1988) contend that there are two important gender related sources of occupational stress namely, multiple roles and discrimination. With regard to multiple roles, social norms have to a large extent created expectations as to what roles men and women should play in the workplace and at home. Even with more domestic chores being assumed by men, care of the home and caring for elderly members of the family still largely remains the woman’s responsibility. Women in most cases have to carry the burden of house work and rearing the children, with married career women working an average of sixteen hours a day, seven days a week (Levi, 1981). Women frequently have to take their sick leave to care for a sick child or elderly family member, which could mean they themselves have to work when becoming ill (Levy & Wegman, 1988).

Sexual, racial and age discrimination contribute to the stress experienced by working women. These forms of discrimination may take on the forms of lower pay (economic terms), or alienation from supervisors and colleagues (social terms) or lowered self-esteem due to less personal growth (personal terms). Women working in occupations where the majority of colleagues were male, often viewed as unwelcome and may experience gender harassment as a result (Levy & Wegman, 1988).

According to Davidson and Cooper (1983) one of the most common occupational stressors facing women managers is that they feel the ‘need to perform better’ at their jobs in order to maintain their credibility when working in a male dominated environment.

McDonald and Korabik (2001) conducted a study that included gender as a source of occupational stress. The study also examined how men and women managers differed in the way they coped with work stress. The participants consisted of 39 managers, 19 men and 20 women. The measuring instruments consisted of questionnaires which included a coping checklist, a job stress scale and a critical incident questionnaire. The subjects also participated in recorded interviews.

The findings of the McDonald and Korabik (2001) study are that the main ‘gender related’ sources of work stress experienced by female managers related to prejudice, discrimination and the conflict of work versus family roles. This finding
emphasizes how gender differences in the workplace can become a source of occupational stress. The women reported significantly more stress than the men due to their perception that the ‘stressors’ of discrimination and prejudice existed in their work environment.

McDonald and Korabik (2001) indicate that the results of the study should be interpreted with caution due to the small sample size. However, in support of the study, Barnett, et al. (1987) maintain that men and women not only find different kinds of work demands and situations stressful, but respond in different ways to perceived stressors, highlighting the role of gender differences in the perception of occupational stressors. Physiological differences could indicate that men and women experience environmental stressors differently.

Levi (1981) states that men cope well in working conditions due to a lower percentage of body fat than women. Studies that tested the differences between men and women in work fitness found that the capacity for muscular work by women is about 60% of that found in men of the same age and degree of physical fitness (Levi, 1981).

The exposure to chemical or physical occupational hazards is significantly greater for men than for women, especially in economically developed countries such as the United States (Waldron, 2001). Regarding gender differences in occupations held, employed men have approximately five times as high a risk of serious work accidents as employed women, with at least 95% of fatal work accidents involving men (Waldron, 2001). Pregnant women are more vulnerable to toxic substances in the workplace especially in the early stages of pregnancy. This creates additional stress for women who work in occupations where they are exposed to noxious substances for example, female workers in the chemical manufacturing industry (Levi, 1981).

Levi (1981) found that women can push themselves to the same state of exhaustion as the men, positing the view that women cannot cope with hard or pressurized work is mainly based on social and psychological factors. The exceptions would be the exposure of women with extremely demanding physical work, for
example, the loading of heavy goods in a hot climate, where it was found that men coped better (Levi, 1981).

According to Capel and Gurnsey (1987)\textsuperscript{35} the tolerance to physical stress involving muscular work is lower in women than in men. The reason for this is due to a lower oxygen uptake in women (Capel & Gurnsey, 1987). Women tolerate thermal stress less well than men but present a greater tolerance to cold conditions, revealing significant gender differences in sub-cutaneous fat levels (Capel & Gurnsey, 1987).

Nelson and Quick (1985) reviewed research on gender differences relating to occupational stress and concluded that women experience greater occupational stress than men. This was attributed to women experiencing career blocks, lower salaries, stereotyping and the interface of work and marriage.

Burke (1996)\textsuperscript{36} contends that men and women experience the occupational stressors of role conflict, overload and ambiguity in the same way, but that women also experience additional stressors namely, sexual harassment and sex discrimination. Regardless of the gender differences in some of the sources of occupational stress, the impact of stress in the work environment can have long-term financial and health ramifications. One of the important consequences of occupational stress is the influence it may have on work performance. The following section examines the impact of stress on work performance.

\textbf{2.7. OCCUPATIONAL STRESS AND WORK PERFORMANCE}

Quick, et al. (2005) emphasise that one of the most important effects of work stress is that it predisposes the individual to industrial and non-industrial accidents. In the United States of America, a 1985 survey conducted by Jones (1988)\textsuperscript{37} reported an estimated cost of accidents and injury to be in the region of $88 billion and work accidents costing a staggering $31.4 billion. The survey further revealed that work accidents in the United States during 1985 caused 12,300 deaths.

According to Bradshaw (2000) and Wissing (2000)\textsuperscript{38}, there is a shortage of Indian statistics pertaining to medical and industrial stress-related costs. The cost of stress related accidents or other stress costs pertaining to the business sector may be
difficult to obtain since large organisations are often reluctant to release figures taken from privately conducted surveys within their organisations (Schlebusch, 2000).\footnote{39}

Fontana (1994)\footnote{40} and Koslowsky (2006)\footnote{41} contend that the effects of stress can lower the competence of the worker and employees who are subjected to frequent occupational stress 27 percent higher error rates and increased absenteeism. Moore-Ede (2003) provides an example whereby extreme job stress and decreased competence resulted in tragedy.

Fatigued engineers at the United States of America’s Kennedy Space Center failed to pay sufficient attention to certain technical details of the NASA space shuttle ‘Challenger’ which exploded during its space launch on 28th January 1986, killing everyone on board (Moore-Ede, 2003). Smulders (1996)\footnote{42} found that absenteeism is higher in workers who perceive job demands, for example time pressures or deadlines to be beyond their control. Koslowsky (2006) reports that women present higher stress related absenteeism records than men, positing that more women than men tend to use absenteeism from work as a coping mechanism.

Sullivan (1995)\footnote{43} cites various important consequences of mismanaged stress in the workplace, namely: loss of vitality and low morale, a decline in communication and distortion of messages, poor decision-making and deteriorating work relationships in the form of animosity, distrust and insubordination. For this reason, employee assistance programmes (EAP) are becoming increasingly popular in the United States and in South Africa (Sullivan, 1995). Employee intervention programmes have been introduced in many Indian organisations addressing stress prevention, problems relating to drug and alcohol abuse and training programmes relating to a healthier and more balanced lifestyle. In 1995 – 1996 more than 42 percent of the top 100 industrial organisations in India developed employee intervention programmes in order to reduce absenteeism and health or stress-related costs (Bisseker, 2006).

In summary, occupational stress in India has been recognised as a serious health risk, with legislation requiring that employers take responsibility for the health of their employees. The gender differences pertaining to sources of occupational
stress include physical attributes in the sex, that either assist or conflict with occupational requirements (for example, physical demands) or those that exist in the work environment itself. Men have a higher mortality rate for accidents and exposure to occupational hazards than women (Waldron, 2001). Severe unmonitored stress can lower the motivation and 28 percent of the worker resulting in accidents, injury or possible death. Indian companies are actively designing intervention programmes in this regard. One of the important requirements in designing intervention programmes is the understanding of the stress process and what happens at a physical and psychological level when the individual is exposed to stress. The following sections discuss the physical and psychological responses to stress by examining the various models of stress, the symptoms of stress and how physiological changes caused by stress can result in disease.

2.8. THE STRESS PROCESS

The concept of stress has generated a great deal of interest in many authors (for example De Longis, Folkman & Lazarus, 1980; Schlebusch, 2000) supporting the conviction that stress is a causal factor in a variety of illnesses. Positive coping resources reduce the chances of the individual suffering from stress-related mental or physical illnesses. Various models of stress reveal how psychologically relevant events translate into physiological changes that may result in serious health-impairment.

2.9. SELYE’S MODEL OF STRESS

Hans Selye has been regarded as the founder of modern stress theory (Capel & Gurnsey, 1987). One of the first attempts to explain the process of stress related illness was given in Selye (1976) whereby the individual experiences three stages during the stress response. The three stages were referred to as GAS or the Generalized Adaptation Syndrome and are as follows:

1. **Alarm reaction** - In this first phase, resistance is lowered and is followed by a counter shock whereby the individual’s defense mechanisms become more active.

2. **Resistance stage** – this is the stage of maximum adaptation and should ideally represent a return to equilibrium for the individual. If the stress continues and defense mechanisms do not work, the individual moves to the third stage.
3. *Exhaustion* – In this stage the adaptive mechanisms collapse. The earlier work of Greenwood (1979) emphasizes that as with any activity in the human body, the stress responses do not always conform to a specified pattern. When the pattern deviates from the norm in a significant manner, the outcome may be diseases of adaptation. This is explained in Selye’s GAS model, whereby in the resistance stage responses, if stress is severe and prolonged, illness could result. Illnesses include psychosomatic disorders, allergies, cardiovascular and kidney disease. Diseases of adaptation are seen as inappropriate responses of the body during a stress reaction, being the indirect result of the attack of stressors (Greenwood, 1979). Successful adaptation to stress signifies the attainment of a new level of homeostasis. When the body fails to provide the balance, disease may result. GAS is essentially a defense mechanism of the human body, a means of coping with stimuli which threaten its homeostasis or stability. Critics of Selye’s work indicate that it ignores the psychological impact of stress on an individual and his/her ability to recognize stress and to act in ways to change the situation or the impact of that stress (Cartwright & Cooper, 2005). Selye is further criticized for ignoring the element of emotion in stress. Selye’s views also emphasise the physiology of stress due to his use of animals in research, neglecting the aspects unique to humans, such as perception and interpretation of stressful experiences (Brannon & Feist, 2005).

2.10. THE STRESS MODEL OF RICHARD LAZARUS

Richard Lazarus interpretation of stress responses had a significant impact on psychologists. Lazarus (in Brannon & Feist, 2005) emphasized that it is not the environment or the stressor that is so important, but the perception of the individual pertaining to the stressful situation that reveals how he or she will cope.

Lazarus research (in Brannon & Feist, 2005) revealed that the ability of people to think and evaluate future events, makes them more vulnerable in ways that animals are not. Thus the effect that stress has on the individual is based on that individual’s feelings of vulnerability and ability to cope. Lazarus recognized that individuals use three kinds of appraisal to analyze situations namely: **Primary appraisal, Secondary appraisal** and **Reappraisal**. **Primary appraisal** concerns the first encounter with the stressful event. At this point, the individual appraises the situation with respect to its
effect on his/her wellbeing. The situation may be viewed as positive or negative or unimportant. A stressful appraisal would indicate that the individual sees the situation as harmful or threatening. This type of interpretation is likely to generate an emotion or what Lazarus refers to as ‘harm’ which results in anger, sadness or disappointment. The interpretation of ‘threat’ is seen as the anticipation of harm and the interpretation of ‘challenge’ as the individual’s confidence in overcoming the demands of the situation. After the individual’s appraisal of the event, he/she forms an impression of his or her ability to control or cope with the situation, be it “harm” or “threat” or “challenge”. This stage is referred to as the secondary appraisal.

The third type of appraisal is reappraisal. This implies that the individual’s appraisals of the situation may change as new information becomes available. Reappraisal does not always reduce the stress; it can increase it since a previously non-threatening situation may be viewed as threatening when once more information has become available. Important in Lazarus’s theory is the ability to cope with a stressful situation. Lazarus and Folkman (1984) define coping as “constantly changing cognitive and behavioural efforts to manage specific external and/or internal demands that are appraised as taxing or exceeding the resources of the person” (p.141).

The classical stress model of Cox (1978) highlights a more contemporary approach towards stress, which emphasizes the interaction between an individual and his or her environment. In the present study, the workplace is considered as a source of environmental stress.

2.11. COX’S MODEL OF STRESS

According to Cox (1978, 1985) the individual becomes stressed when a discrepancy occurs between the perceived level of the stressful demands and his/her perceived ability to respond to and to cope with the demands. There is thus an imbalance between a perceived demand and a perceived capacity to cope. Cox (1985) notes that: “The classic stressful situation is one in which the person’s resources are not well matched to the level of demand and where there are constraints on coping and little social support. Stress, itself, is an individual psychological state. It is to do
with the person’s perception of the work environment and the emotional experience of it.

Cox (1978, 1985) maintains that perception plays an important role in ‘recognising’ stressors. The individual’s ability to cope with environmental threats or adverse events is also emphasized in an earlier work. This view would suggest that if the individual can perceive environmental and psychological demands made on him, he can learn (for example, through counselling as a form of intervention) to recognise which are the best resources to call upon when confronted with perceived stressful demands.

Cox (1985) emphasizes that the stress phases experienced by the individual involve a complex interactive process with various levels of appraisal, emotion and response, with the immediate response to a stressful situation being in the form of negative emotion, propelling the individual into flight or fight action.

Cox (1978, 1985) maintains that stress is an imbalance between a perceived demand and a perceived capability, with the demands changing at various levels of appraisal during the phases of the stress process. An appraisal of capability takes into account external resources as well as internal capabilities. In using the ‘capabilities’ the individuals makes an assessment of the social support available (external factors) and appraises his or her internal strengths or limitations in order to deal with the stressor. Successfully coping with stress would thus be reliant on the individual’s assessment of where his/her coping resources exist, namely from an internal or an external source.

Cox’s model could be compared with Rotter’s theory of Locus of Control which asserts that some individuals have a stronger internal locus of control, namely a greater sense of self-reliance. According to Rotter’s theory, individuals with a stronger internal locus of control have a greater influence over their destiny or circumstances, which would suggest that they would cope better in stress-related situations. Mayer and Sutton (1996) contend that individuals with a strong internal locus of control are associated with greater academic achievement, more effective relationships and a greater problem-solving ability than those individuals showing a greater external locus of control. When further compared to Cox’s model, the
individual with the stronger internal locus of control would reveal a more positive appraisal of his/her internal capabilities than the individual with a stronger external locus of control, which would reveal a less confident appraisal of his/her internal capabilities in coping with stress. As a part of the individual’s appraisal of his/her coping abilities, recognition of the symptoms of stress whether physical or psychological, play an important role in ‘warning’ the individual that he or she is experiencing unhealthy stress levels.

2.12. SYMPTOMS OF STRESS

Schlebusch (2000) arranges the symptoms of stress into three categories namely: physical, psychological and behavioural reactions. Some of the significant physical reactions include difficulty in relaxing, unexplained headaches, erratic bowel function, unusual tiredness, dizziness, breathlessness, excessive perspiration, muscle tension and high blood pressure (Schlebusch, 2000).

Rogers and Graham (1999) include the aforementioned physical symptoms of stress but add that infections, hair loss and skin disorders have also been associated with excessive stress. Schlebusch (2000) states that the skin is often the target organ for stress with studies reporting approximately 40 percent of all skin disorders have been associated with excessive stress. Examples of stress related skin disorders are eczema, acne and psoriasis.

Many authors for example (Lindenfield & Vandenburg, 2000; Schlebusch, 2000; Sutton, 2000) provide the following important psychological and behavioral symptoms of stress namely: inability to laugh, feelings of loneliness, fearfulness, inability to concentrate, suppressed anger and feelings of anxiety.

Fontana (1994) states the emotional effects of stress include hypochondria, changes in personality traits, a weakening in moral and emotional constraints and a reduction of self-esteem. An increase in the consumption of alcohol, drugs, food or cigarettes is an other indication of negative coping behaviour related to stress (Musikanth, 1996).

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Stress has been recognized as a major cause of sexual dysfunction and until recently due to a ‘male orientated society’, the study of female sexuality and stress related problems have been sadly neglected (Capel & Gurnsey, 1987). Recent research reports that women who have stressful occupations may experience hormonal changes, reduced libido and other symptoms of sexual dysfunction (Capel & Gurnsey, 1987).

In summary, most contemporary models of the stress process emphasise the role of perception in identifying stressors. One of the most widely recognised models of the stress response is that of Richard Lazarus. Most models of stress reveal that successful management of stress depends on the individual’s choice of coping resources and that stress only becomes harmful when there is some imbalance and the individual’s coping mechanisms fail. The numerous observable symptoms of stress include physiological and psychological changes resulting in for example, headaches, fatigue or changes in behaviour. The following discussion examines the inner complex neurological and physiological transformations that play a vital role in the stress response.

2.13. THE NERVOUS SYSTEM AND THE PHYSIOLOGY OF THE STRESS RESPONSE

The process of stress involves the inter-relationship between mind and body. How stressors are perceived has a direct impact on how the individual reacts at a physiological level. A great deal of stress-related literature (for example Brannon & Feist, 2005; Schlebusch, 2000) include the following information relating to the physiological responses to stress. The nervous system is involved at the ‘root’ of stress-related behaviour since it provides the physiological pathway for processing stress-related information (Schlebusch, 2000).

2.13.1. THE NERVOUS SYSTEM

The two main divisions of the nervous system are the central nervous system (CNS) and the peripheral nervous system (PNS). The CNS consists of the brain and spinal cord. The nervous system comprises of billions of cells referred to as neurons. The main function of the neurons is to relay information from the sense organs to the brain, to stimulate the movement of muscles and to connect sensory neurons to motor
neurons. The peripheral nervous system is found outside the brain and spinal cord and is divided into two parts: the Somatic Nervous System (SNS) and the Autonomic Nervous System (ANS). The Somatic Nervous System stimulates the muscles and skin areas by sending neural impulses which travel towards the spinal cord by way of sensory nerves located in the somatic nervous system.

The Autonomic Nervous System (ANS) does not require conscious thought and is beyond voluntary control. The ANS allows for responses through the sympathetic nervous system and the parasympathetic nervous system. The sympathetic division of the ANS stimulates the body’s resources in stressful, emotional or emergency situations. This is frequently referred to as the “fight or flight” response. The sympathetic activation stimulates the body for motor activity necessary for defense or escape. The reactions are an increase in heart rate, constriction of the blood vessels in the skin, an increase in respiration, dilation of the pupils and stimulation of the sweat glands. The parasympathetic division of the ANS induces relaxation and operates under non-stressful conditions. Both the sympathetic and the parasympathetic nervous system stimulate the same target organs, with the one activating a function in an organ and the other decreasing it. When the stressor is no longer a ‘threat’ the parasympathetic nervous system plays a role in reducing the state of arousal that was previously activated by the sympathetic nervous system and the stressful event.

2.13.2. THE NEUROENDOCRINE SYSTEM AND THE STRESS RESPONSE

The pituitary gland is connected to the hypothalamus in the brain. In addition to producing hormones, the hypothalamus controls the functioning of the pituitary gland. One of the most important hormones relating to the stress response is the adrenocorticotropic hormone (ACTH). ACTH acts on the adrenal glands. The adrenal glands are located on top of each kidney. The adrenal medulla is a part of the adrenal gland system. The adrenal glands secrete hormones as a part of the stress response.

Capel and Gurnsey (1987) state that small differences exist in the way men and women respond physically to stress, indicating that men respond to stress predominantly via the sympathico-adrenal pathway whilst women respond primarily via their pituitary-adrenal System.
Stress initiates a complex series of events within the neuro-endocrine system. As part of the stress response, the anterior pituitary which is part of the pituitary gland, situated at the base of the brain, secretes ACTH, which stimulates the adrenal glands to secrete glucocorticoids, which include cortisol. This secretion mobilises the body’s resources of energy, increasing the blood sugar levels. The cortisol provides an anti-inflammatory effect, protecting the body against swelling sustained in injuries during the fight or flight process. During a stressful situation, the adrenal medulla is activated and this results in the secretion of catecholamines, chemicals that include norepinephrine and epinephrine. Norepinephrine is one of the neuro-transmitters of the autonomic nervous system. Neuro-transmitters operate at the synapse whereas hormones are found circulating in the blood stream. Norepinephrine is produced in many areas of the body, not exclusively in the adrenal medulla. Epinephrine is produced in the adrenal medulla. The production of epinephrine is strongly associated with stress and the amount of epinephrine secreted can be determined in the analysis of the urine (Brannon & Feist, 2005).

Frankenhaeuser (2001) discusses an earlier gender study that took place in the 1970’s whereby epinephrine levels were tested whilst respondents were completing a battery of difficult cognitive tests. It was thought that gender differences in values relating to achievement would be reflected on a physiological level, for example an increase in epinephrine secretions when confronted with challenging or stressful situations. The findings demonstrated that women were less prone to responding to the ‘achievement demands’ of the tests since their epinephrine secretions were significantly lower than the male subjects. Recent studies using the same procedure as the aforementioned 1970’s study, resulted in women subjects presenting an increase of epinephrine secretions, indicating that women’s stress responses related to achievement demands are possibly changing due to a perceived shift in values regarding achievement and success (Frankenhaeuser, 2001).

Smith (2003) contends that little research has been directed at the gender differences relating to stress-related physiological arousal; however, the research that has been conducted reveals that men exhibit greater levels of catecholamines during acute stress periods. Smith (2003) posits that a greater knowledge of physiological
arousal patterns allows for a better understanding of cognitive appraisal styles and coping resources related to stress.

In summary, the central nervous system plays a vital role in the mental and physical interpretation of stress. Stress-related secretions mobilize the body into dealing with the stress. An excess of stress secretions can result in significant health impairment. With the monitoring of excessive long term stress, the risk of stress related illnesses may be prevented by making use of medical resources and psychological interventions. The following discussion examines the link between stress and illness.

2.14. STRESS AND ILLNESS

Levy and Wegman (1988) report occupational stress as one of the many factors in stress-related conditions concluding that stress is recognised as the primary etiologic agent for burnout, post-traumatic stress disorder and mass psychogenic illness. In the earlier work of Lazarus and Monat (1977) the direct consequences of stress on the body are described. For example, the body is affected by systemic or physiological stress which is concerned with the disturbance of tissue systems. When the individual experiences environmental demands as exceeding his/her coping resources, he or she may experience a reduction in psychological and physical well-being, resulting in possible illness (Lazarus & Folkman, 1984). Section 2.14.1 investigates how certain individuals may be predisposed to stress-related illnesses. Section 2.14.2 discusses the impact of stress on the immune system.

2.14.1. STRESS AND THE PREDISPOSITION TO ILLNESS

Why does stress cause illness in some individuals and not in others? Brannon and Feist (2005) provide two theories that afford an explanation for this, namely: the diathesis model and the hardy personality. The diathesis-stress model suggests that some individuals are more vulnerable to stress-related illness due to biochemical imbalances or genetic weaknesses that predispose them to illness caused by stress. This model suggests that there have to be two necessary factors which produce illness. In the first instance, the individual must have a predisposition to the illness and secondly the individual has to experience stress in order to activate the illness. This
approach suggests that diabetic individuals respond pathologically to stressful situations with which most individuals could easily cope.

Earlier findings reported in Greenwood (1979) suggest that extremely stressful or traumatic events can lead to psychogenic death, with the causes being the loss of a loved one, the loss of a job and even retirement producing a variety of somatic disorders, illness or psychological disorders which could lead to sudden death. Suzanne Kobasa (1983) proposed the notion of the hardy personality in order to explain why some individuals become ill when stressed and others remain healthy. The hardy personality model grew out of the existential personality theory, which maintained that the authentic person was in control of his or her life. The ‘hardy personality’ may be described as an individual who is able to withstand stress and not succumb to illness. The hardy personality expresses a stronger sense of commitment to self, a strong internal locus of control over his or her life and is more likely to view life readjustments like change, as a challenge. Individuals who become ill are characterized as having an external locus of control, a sense of meaninglessness in their lives and a feeling of alienation from self, with a lack of involvement with their environment (Brannon & Feist, 2007).

Graham (2007) states that stress can also cause hypertension which affects major organs in the body, frequently resulting in cerebral strokes and renal disease. Edwards (2007) investigated the relationship between stress, lifestyles and hypertension. The subjects consisted of 12 women aged between 31-64 years. The subjects were interviewed in order to determine their current stressors, medical history, work situations, personalities and coping styles. The findings reported that where subjects had been diagnosed with hypertension, they also experienced high levels of ongoing stress related to work and financial matters, poor living conditions and lack of social support. The study reveals that cultural and social factors may play a role in stress related illnesses, especially regarding hypertension.

Stress-related hypertension has been identified as an important health science priority in India, with statistics taken in 2003 reporting upto 6 million Indians needing care for this disease (Anderson, 2003). The Indian Dialyses and Transplantation
Registry of 1989 indicate a high proportion of patients that develops chronic renal failure due to malignant hypertension (Anderson, 2003)\textsuperscript{55}.

Brannon and Feist (2007) indicate that stress can cause headaches, viral illness and particularly cardio-vascular disease.

Holford (2006)\textsuperscript{56} posits that prolonged stress causes heart disease with symptoms like tension, frustration, sadness and hostility, significantly increasing the risk of a heart attack. The individual who experiences intense emotions, for example, frustration, anger, hostility, doubles the risk of having a heart attack in one hour immediately after the stressful event (Holford, 2006). A heavy work load and a high degree of work responsibility increase the risk of heart attacks (Trauer, 1990).

In a Swedish study conducted by Alfredsson, Spetz and Theorell (1985)\textsuperscript{57}, the occupations of workers taken from a population of 600,000 men and 400,000 women under the age of 65 from five different countries were examined, in order to establish which occupational stress factors contribute to the risk of workers becoming hospitalized for myocardial infraction or heart disease. The analysis was based on a classification of approximately 100 occupations. Participants were asked how they viewed their jobs, for example, if the work was perceived as monotonous, the amount of overtime worked and the physical symptoms that the workers experienced. Occupations were divided under the headings ‘hectic’ or ‘non-hectic’, “monotonous” or ‘non-monotonous’ and so forth. Standard methodologies for analysing confounding variables were used. The demographic variables of full-time versus part-time work, type of residence, type of community, income and number of children were used. The hospitalisation for myocardial infraction was used as the dependent variable.

The findings reported that the patterns for men and women were different generally; however, there were some similarities. Both men and women reported higher risks for myocardial infraction when their occupations were described as hectic or monotonous. Shift work was also associated with increased risk in both genders. Women in occupations which demanded more than 10 hours of overtime per week reported to be at a greater risk of becoming hospitalised for myocardial infraction. For men the opposite was presented, namely that overtime was associated with protection
against hospitalisation for heart disease. The most significant finding was that jobs classified as being ‘hectic’, ‘monotonous’, or ‘non-learning’ and jobs with very little decision-making latitude, were associated with a greater myocardial infraction risk for both genders. A limitation in the Alfredsson, et al. (1985) study is that the researchers did not have access to information relating to the medical and biological risk factors of the subjects. This suggests that medical risk factors like hypertension or smoking which have been associated with the increased risk of heart disease were not taken into consideration. The following section investigates the impact of stress on the immunity system.

2.14.2. STRESS AND DISEASE: AN IMMUNOLOGIC PERSPECTIVE

Increasingly, members of the medical profession have explored the link between mind and body, with the conclusion that specific negative psychological states caused by stress or a chemical imbalance, can cause the immunity system to decrease in efficiency or falter (Day, 1982).

A theoretical premise called psycho-neuro-immunology explains the link between psychological factors which have an impact on the physiology of the body. Psycho-neuro-immunology is a field of study that maintains that psychological and biological systems are interrelated; it thus investigates the relationship between psycho-social processes and the activities of the immunity and endocrine systems (Miranda, 1999; Singh, 1999).58

According to Graham (2005) when stress reactions are prolonged, the individual’s immunity system is placed ‘on hold’ whilst the body’s energies struggle to deal with the stress-related ‘crisis’. When this occurs, the body’s immunity system is suppressed and the individual becomes more susceptible to illness. An estimated 75 percent of all illnesses are thought to be stress-related (Graham, 2005).

One of the diseases frequently linked to stress is cancer. Martin (2005) suggests that there are two important components in the mind-cancer or stress-cancer connection:
• Factors in an individual or thinking patterns may increase the susceptibility to cancer by reducing the body’s ability to deal with and destroy cancer cells.

• Psychological aspects influence the recovery of individuals who have cancer and their chances of survival.

An example of how unsuccessful coping with stressful life-events can lead to illness in the predisposed individual is provided in Burns (1988)\(^5^9\) where it is stated that the New York Institute of Applied Biology studied 450 cancer patients over a period of 12 years. It was found that a significant number of cancer patients had certain stress-related experiences in common, for example the loss of a personal relationship. Quick, et al (2005) contends that stress alone does not cause cancer, indicating that it is primary risk factors that account for the different groups of cancers. The risk factors include smoking, alcohol consumption, dietary factors and occupational risks; for example, exposure to radiation. To conclude, the aforementioned views support the theory that the mind may play an important role in the individual’s health and well-being. This suggests that the individual’s positive interpretation of an event results in less stress and better health than the individual who interprets an event as negative or threatening. In summary, certain individuals have a predisposition for stress-related illnesses. The consequences of stress-related disease involve how the individual perceives the stressor.

The primary appraisal of the stressor determines the physical and psychological responses. If the appraisal of the stressor is consistently seen as negative or as a ‘threat’, the body’s immunity system may be affected resulting in ill health. An important factor in overcoming stressful life events is well developed coping skills. The literature provides many different theories pertaining to stress and coping resources. The following discussion investigates the nature of coping resources and the role of coping resources in the management of stress.

2.15. STRESS COPING

Courage is resistance to fear, mastery of fear, not absence of fear

- Mark Twain

In the management of stress, the question arises as to why do some individuals cope well with stress whilst others do not? Stress and stress-related disorders as
previously cited in the literature, continually refer to the close working relationship between mind and body. The manifestations of stress are varied and individualistic and where biological predisposition plays a role in the management of stress, an important factor in determining the impact of stress on the individual, is his or her perceived ability (the role of the mind) to cope. The individual is likely to be more affected by stress when he or she is vulnerable, or when there is a lack of perceived resources available to deal with stressful situations. Resources may be social or physical; however, their importance is determined by psychological factors and the perception of the situation (Brannon & Feist, 2005).

Lazarus and Folkman (1984) emphasise that the most important factor in coping, is what the individual considers to be personally important and not merely the social or physical deficits in the coping process. This view relates to the perception that the individual has of his or her circumstances, focusing on the psychological process in stress and coping.

The following section defines coping, examines coping and non-coping factors in an occupational context, reviews how various resources impact on coping and examines the cognitive and personality factors in the coping process.

2.15.1. DEFINING COPING AND NON-COPING OF STRESS

One of the most widely known theories regarding coping and stress is that of Lazarus and his colleagues. In his classical work, Lazarus (1966) states that coping is a strategy used to deal with a threat. Lazarus and Folkman (1984) define coping as “constantly changing cognitive and behavioral efforts to manage specific external and or internal demands that are appraised as taxing or exceeding the resources of the person”.

Brannon and Feist (2005) indicate that the definition as given above highlights the following factors related to coping. In the first instance, coping is a process and is constantly changing as the individual evaluates his or her efforts. Secondly, coping is a learned way of responding to stressful circumstances. Thirdly, there has to be an effort on the part of the individual and fourthly, coping is an effort to manage the problem. Flemming, Baum and Singer (1984) describe coping as a central part in the
stress process, and includes all responses to danger or any form of threat. Essentially, coping is directed at the overall reduction of stress and includes any attempt to minimise, avoid or deal with the effects of stressors (Matteson & Ivancevich, 1989).

Lazarus and Folkman (1984) maintain that coping has two main functions namely, the regulation of distress and emotions causing the distress, referred to as emotion-focused coping and the management of the problem that is actually causing the distress, referred to as problem-focused coping. Lazarus and Folkman (1984) distinguish between control beliefs and appraisals versus control as a coping process. Generalised ideas or beliefs about control are considered cognitive factors that impact the appraisal of the situation, be it a challenge or a threat. Control as a coping process pertains to cognitive and behavioural efforts to exercise control in a stressful situation. In a study conducted by Lazarus and Folkman (1984), it was found that the belief that an event is controllable, does not always lead to a reduction of stress in the individual and believing that an event is uncontrollable does not always lead to an increase in stress. Events are not always controllable in an occupational context, but how the employee copes with the work events or stressors is reflected in his or her health, happiness and productivity.

2.15.2. COPING WITH STRESS IN AN OCCUPATIONAL CONTEXT

Callan (2003) describes the conative profile of a coping individual as someone who makes an attempt to modify or get rid of the source of stress by facing the reality of the adverse event. In the working environment, the coping individual makes an effort to obtain information that can increase the predictability of a situation, assisting in the perception of control in dealing with future problems (Callan, 2003). Marais (2005) indicates that the coping individual ‘manages’ or modifies a stressful event such as organisational change by maintaining the usual productivity levels and quality of work. In contrast, the non-coping individual that experiences a loss of emotional control may respond by having arguments and disputes with management and colleagues. This could adversely affect productivity in the organisation.

Lovell (1994) supports the view that the non-coping individual contributes to the loss of organisational productivity and that individuals without emotional control
are frequently found to have an increased rate of conflict with colleagues, increased absenteeism and an escalation of occupational accidents.

Smith (2003) advocates that poor coping patterns can be changed by learning special problem-solving techniques which can be applied in any stress-related situation, especially in an occupational context. Assisting employees to develop better coping skills could thus be a way of reducing occupational accidents, absenteeism and other negative factors. How men and women cope with stress at work largely depends on their perception of the coping resources available to them.

2.15.3. RESOURCES AND COPING

Collins (1990) defines the word resource as “the ability to deal with problems; initiative or quick wittedness”. It may thus be concluded that resources are the aspects of the self that provide the skills for handling and coping with stressful events and are thus the support systems that assist the individual to deal with adverse situations.

Callan (2003) distinguishes between external and internal coping resources that assist the individual to overcome adverse or stressful events. Internal coping resources consist of the personality and cognitive factors that provide the psychological context for coping.

Ashford (1988) refers to internal coping resources as consisting of self-efficacy, self-esteem, locus of control, freedom of self-denigration and the tolerance of ambiguity. Self-efficacy concerns the control or mastery that the individual perceives that he or she has in order to deal with a given situation. Self-esteem is the positive regard that the individual has for himself or herself. The differences in locus of control have been shown to mediate the relationship of stressful life events and changes to depression and anxiety. Freedom of self-denigration entails the level of negative attitudes that the individual has for him or herself. Tolerance of ambiguity is viewed as an important internal coping resource implying that individuals showing positive indications in this area cope well with events that include change and uncertainty.
As regards coping patterns and personality characteristics in individuals, Fleishman (1984) advocates that a strong self-esteem appears to have a positive effect in coping with stress. Self-efficacy is also considered to be a positive factor in coping with stress. However, the underlying factor in coping appears to be ‘control’ or mastery, the belief that the individual can control aspects that affect him or herself (Fleishman, 1984).

Callan (2003) includes socio-emotional support and tangible support as external coping resources. Socio-emotional support assists in buffering the psychological distress that the individual experiences in times of crisis. The types of social support may be divided into emotional assistance, for example, caring, empathy and tangible support. Tangible support includes physical aid and could be in the form of financial support or offering information to assist the individual in order to cope with the stressful event. Social support is usually provided by family, colleagues or friends.

Ben-Sira (1985) indicates that where individuals have the self-confidence to overcome adverse life situations, one of the sources lies in the positive interaction between the individual and society. Individuals with supportive families tend to rely on active coping methods whilst individuals without supportive family systems reveal a tendency to use avoidance in order to cope with adverse life events (Callan, 2003). Lazarus and Folkman (1984) combine external and internal coping resources and provide the following factors as essential in the coping process: health and energy, a positive belief concerning personal ability, and problem-solving skills, social skills, social support and material resources.

Antonovsky (1979) includes the coping resources provided in Lazarus and Folkman (1984) but contends that through life experiences individuals develop ‘generalized resistance resources’ (GRR’s). Briefly, GRR’s are characteristics that occur in the individual or society that facilitate coping with a broad variety of stressors. The most important GRR’s are Artifactual-material GRR’s, Cognitive GRR’s, Interpersonal-relation GRR’s and Macro-socio-cultural GRR’s. Arti-factual-material GRRs consist of shelter, food and money. Cognitive GRR’s consist of the individual’s knowledge or intelligence. Interpersonal-relation GRR’s are factors
relating to social support and Macro-socio-cultural GRRs pertain to religions and rituals. A more detailed discussion pertaining to Antonovsky’s GRR’s is provided in another Chapter.

Whether men and women differ in the use of coping resources is frequently contested in the literature. Hamilton and Fagot (1988)\textsuperscript{65} for example, contend that both psychological theoreticians and laypersons postulate that there are significant differences in masculine and feminine coping behaviour despite the lack of supporting empirical evidence.

Havlovic and Keenan (2001)\textsuperscript{66} indicate that gender has been included in various studies pertaining to coping but the findings vary considerably. Martocchio and O’Leary (1989) conducted a meta-analysis on 15 studies that examined gender differences in occupational stress and coping. In contrast to previous qualitative reviews in the literature, the results of the meta-analysis revealed that there were no gender differences in experienced or perceived stress.

Hamilton and Fagot (2006) conducted a gender study in order to compare male and female coping behaviours, testing the theory that men use instrumental coping strategies more frequently than women. Women were thought to use more emotion-focused coping solutions to stress. A sample of 51 female and 39 male undergraduates were interviewed telephonically over a period of 8 weeks. An inventory of 28 chronic stressors was used. Analyses of variance (ANOVA) were used to measure gender differences in the frequency of daily stressors, the use of problem solving behaviour and concomitant perceptions of stress. The results showed that there were no significant gender differences for the frequency of stressful events, stress-related behaviour and coping styles.

In summary, it is evident that combinations of external and internal coping resources play an important role in coping with stressful events. Coping is central to the stress process and entails how the individual perceives and reacts to a stressor. Studies relating to gender and coping reveal that the findings vary considerably. Several authors, for example (Hamilton & Fagot, 1988; Havlovic & Keenen, 2001) posit that more coping related gender studies are required in order to replicate and
extend the research conducted to date. Personality and cognitive profiles are widely recognised as important factors influencing the way the individual copes with stress.

2.15.4. COGNITIVE AND PERSONALITY FACTORS IN COPING WITH STRESS

Cognitive factors entail how the individual perceives and interprets the world. Personality characteristics may influence the way in which the individual responds to stress, best exemplified in the ‘Type A’ personality. It is thus the combination of cognitive and personality factors that influence the manner in which an individual copes with an adverse event.

2.15.5. COGNITIVE FACTORS

Dealing with stress entails not only an emotional or physical response, but results in a complex cognitive process related to how the individual perceives or ‘thinks about’ the stressful event.

Everly (2000)\textsuperscript{67} describes the cognitive-affective domain as the essential “causal” stage in most stress reactions. The cognitive factors in the coping process can therefore not be excluded from the discussion. An overview of some of the theoretical viewpoints in particular those of Ashford (2007) and Cooper and Payne (2001)\textsuperscript{68} will assist in creating a background of how cognitive abilities impact on stress and the coping process.

Ashford (2007) describes the cognitive process as an effort to define and redefine the personal implications or meaning of an event. Individuals may positively redefine adverse events as opportunities or challenges.

Callan (2003) refers to this process as the individual being in control of a situation due to his or her positive reappraisal of their coping abilities. Non-coping individuals have a negative reappraisal of their coping abilities and perceive themselves as out of control or powerless.

Ashford (2006) expands the concept of control in coping, by relating it to emotional self-control whereby emotional discomfort is managed by using affect
regulation or resigned acceptance. These “coping techniques” focus on managing or controlling stress-related emotions such as anger, depression and confusion. Individuals who have a negative reappraisal of their coping abilities could thus be viewed as having a loss of emotional control, resulting in unmanaged anger, depression and confusion.

Cooper and Payne (2001) view cognitive abilities in relationship to the study of intelligence, supporting the approach that intelligence plays an important role in how the individual copes with stress. The classical work of Lazarus (1966) created a framework for understanding cognitive ability and stress. In order to explain the role of intelligence in coping, Cooper and Payne (2001) combine Sternberg’s theory of intelligence which consists of componential sub-theory, experiential sub-theory and contextual sub-theory with Lazarus’ three stages of the coping process, namely, the primary appraisal phase, the secondary appraisal phase and the coping behaviour phase. This explanation for the use of cognitive skills to cope with stress emphasizes the importance of practical and social intelligence impacting on how the individual experiences or interprets the world by using the three phases, primary and secondary appraisal and coping behaviour in order to process the stress. Using the data of 476 subjects, Cooper and Payne (2001) formulated three constellations that indicate ‘intelligent’ responses to the problems of living:

Social problem-solving ability, whereby the individual reasons logically and interprets the situation accurately dealing with the problem resourcefully. The individual with poor problem-solving ability may not analyse the situation correctly and thus not use the best resources available.

- Verbal ability, whereby the individual speaks clearly, converses well and deals effectively with people.
- Social competence, whereby the individual admits mistakes, has a social conscience, accepts others for what they are and is sensitive to other individuals’ needs.
- Individuals with this skill can ensure the assistance of those around them, thus providing resources that may assist in modifying the stressors in the situation.
Emotion-focused coping involves cognitive activity, in that it is a cognitive strategy used to control or manage emotions caused by stressful events (Compass & Orosan, 2003). An example would be the individual who tries to cope with the painful emotions of loss by escaping into denial (Cooper & Payne, 2001).

Cooper and Payne (2001) further emphasise that the variety of stressors require different cognitive skills. A physical threat for example, would provide a different type of stressor than not being able to complete a complex task which would be considered a cognitive stressor. McCrae (2004) confirms that different stressors require different cognitive coping responses and provides the following examples: fatalism, faith and expression of feelings are mostly used in order to cope with loss, whilst threats (for example, possible job loss) result in coping responses of wishful thinking or fatalism.

Cooper and Payne (2001) maintain that coping takes place at both behavioural and cognitive levels, resulting in the classification of four forms of psychological coping styles coming under the behavioural or cognitive response headings. The scheme illustrates this view which has been developed by incorporating the different theories of what coping entails. Coping responses are either problem-orientated or emotion-orientated, with each response having a positive or negative behavioural or cognitive action. It includes the coping responses known as engagement versus disengagement, denial, distancing and repression. A positive coping style includes seeking social support or engagement and is named as behavioural response. Emotional expressiveness is considered to be a positive cognitive response. Negative coping responses (disengagement – depicted in italics) include avoidance as a behavioural response and wishful thinking as a cognitive response.

The use of the engagement response entails ‘approach or confrontation’ during coping, whilst the use of a disengagement response entails a withdrawal response during coping. The four forms of coping illustrated in the schemes should not be viewed as independent. Coping styles have also been associated with personality traits as exemplified in Type A personalities who tend to experience higher levels of stress.
than individuals with Type B personalities. The following discussion examines how personality factors influence coping patterns.

2.15.6. PERSONALITY FACTORS

The literature contains many differing opinions concerning coping and personality actors. Folkman and Lazarus (2000) suggest that overall personality trait measures are not sound predictors of how the individual will cope with stress. Folkman, et al. (2006) emphasise that there is insufficient evidence that personality characteristics influence the coping process in the individual.

Fleishman (1984) postulates that certain personality characteristics may relate to certain coping styles. Research done by Amirkhan (2004) showed only sporadically significant relationships between coping behaviour and personality.

Everly (1990) proposes that personality type is related to stress-related disease and that treatment planning for stress-related diseases should acknowledge personality factors in the individual if treatment is to be completely successful. An example would be the type A personality, who would require intervention pertaining to his or her ‘driven’ nature in order to prevent any further cardio-vascular disorders, should such a diagnosis already exist.

2.16. SUMMARY

The aftermath of recessions, increasing international competition and the relocation of roles and responsibilities amongst many other work related and global changes have been viewed as the main causes of stress in the modern world. The origins or sources of stress arise from many different factors. Life stressors are omnipresent and are encountered on a daily basis. Sources of general life stress include relationship problems, health problems, financial problems and so forth. Occupational stress has been recognised as a significant source of stress and forms the basis of investigation in the present study.

Occupational stress is recognised as an important health risk in Indian software industry, with references made as to how employers can alleviate health
risks for their employees. One of the factors mentioned in the Basic Conditions of Employment Act (2007) is the assisting of employees with coping strategies in order to deal with stressors and health hazards in the work environment. There are many sources of occupational stress with role ambiguity, role conflict, ergonomic factors, shift work and work load being some of the most pertinent examples identified in the literature. Stress is viewed as a process central to the relationship between health and behaviour, providing an understanding of how psychologically relevant events translate into physiological changes which may be health-impairing or illness related in the IT industry. The link between stress and disease has generated a great deal of interest, with recent studies for example (Singh, 1999) reporting a correlation between stress and cancer. Regarding gender studies of stress and coping, (Haw, 2002; McDonald & Korabik, 2005) state that the vast majority of stress-related studies have omitted to include female subjects or have not thoroughly examined gender differences in these areas. Other writers for example (Jick and Mitz, 2005) contend that differences may exist in the type of occupational stressors that men and women experience as well as the manner in which they cope with stressors.

Havlovic and Keenen (2006) posit that findings regarding gender studies and coping vary considerably. Many writers for example, (Hamilton & Fagot, 1988) state that with the contradictions in the findings relating to gender and coping, a great deal of research is still required in this area. Coping resources are made up of internal and external factors, both being vital for the individual to cope with an adverse event. The literature refers to cognitive and personality factors related to coping resources. The most recognised theorists in the literature for example (Antonovksy, 2004; Lazarus & Folkman, 1884) include problem solving skills, social skills and social support as important coping resources.

Antonovsky (2006) includes GRRs or generalised resistance resources as vital characteristics in the coping process. In continuation with the discussion pertaining to coping and personality factors, the meticulous analysis of literature reviews clearly identified the research gaps in studying stress dynamics in the manufacturing industry. It is also found that so far no serious studies have been conducted on stress dynamics and its influence over individual and organisational efficiency in manufacturing.
industry. An attempt has been made in this direction to obtain a torrent of results regarding stress dynamics and its influence among employees of the company.
References:


