Chapter - 2

LITERATURE SURVEY

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2.1 Different approaches for the study of work stress

Over the past 30-35 years, the knowledge base on occupational stress has increased substantially and it has been noticed that occupational stress is rapidly becoming the single greatest cause of occupational disease (Noblet and La Montagne, 2006). This calls for a systematic assessment of factors responsible for work stress. Stress audit is a proactive approach to the management of stress at work. It helps to assess organizational and individual strengths and weaknesses and acquire the information necessary to focus on desired response. When the information provided by an audit is appropriately acted upon, there tends to be subsequent reduction in absenteeism and increased levels of commitment and productivity (Leontaridi and Ward, 2002). It has been concluded in several different reviews of scientific literature on stress that there are essentially three different, but overlapping approaches to the study of work stress (Cox, 1993). The first approach namely ‘Engineering Approach’ treats stress as a stimulus characteristics of the person’s environment, usually conceived in terms of load or level of demand placed on the individual (Cox, 1990). In
this approach occupational stress is treated as a property of work environment, and usually as an objectively measurable aspect of that environment. According to the approach, stress was said to produce a strain reaction which although often reversible, but in many occasions proves to be irreversible (Sutherland and Cooper, 1990).

The second approach known as ‘Physiological Approach’ received its initial impetus from the work of Selye (1950) which defines stress “as a state manifested by a specific syndrome, which consists all the non specific changes with in the biologic system”. It treats stress as a dependent variable of a particular physiological response to a threatening or damaging environment.

The third approach, namely ‘Psychological’ approach, conceptualizes work stress in terms of the dynamic interaction between the person and their work environment. The development of psychological models has been to some extent, an attempt to over come the criticisms leveled at the earlier approaches. Psychological approaches to the definition of stress are largely consistent with the definition of psychosocial hazards of international labour office (ILO, 1986) and with the definition of well being recommended by the World Health Organization (WHO, 1986).

2.2 Research work on work stress in the context of work

The following literature review points out psychological hazards, in the context of work. The potential stressors for these hazards are organizational culture and function, role in the organization, career development, decision latitude and control, inter personal relationship at work, work-home interface and change (Mackay et al., 2004).
2.2.1 Organizational culture and function

One of the main source of stress is organization itself. French and Caplan (1970) found that people with greater opportunities for participation in decision making reported greater job satisfaction. Michie and Williams (2002) points out that non participation in decision making at work is one of the significant predictor of work related ill health.

Most of the workers in Europe feel that there exists restrictions in individual freedom, autonomy and identity at their work (Whetten and Camareron, 2007). Studies on the employees perceptions and descriptions of their organizations, suggest three distinct aspects of organizational function and culture - organization as a task environment, as a problem solving environment and as a development environment (Cox and Leiter, 1992; Cox and Hawarth, 1990). The available evidence suggests that the organizations perceived to be poor in respect to these environments, will likely to be associated with higher stress. Landy (1992) pointed out that improper management behavior and supervisory style are mainly responsible for the work stress. Meanwhile Leka et al. (2003) notes that factors like poor communication, poor leadership, and lack of clarity about the organizational objectives and structure of the organization may lead to work stress.

Mansor and Tayid (2010) found a strong correlation among organizational culture, employee job stress and job satisfaction among the employees of Malaysia in direct tax administration. The effect of stressors in organizational context of IT employees were analyzed by Kim and Wright (2007) and found that stressors like resources, participation and feedback leads to work exhaustion and accelerate turn over intensions.
2.2.2 Role in the organization

Another major source of stress is associated with persons role at work. A great deal of research is done on role ambiguity and role conflict. Role ambiguity is the result of employees uncertainties, lack of information about the job role, expectation and responsibilities (Cox et al., 2000). Colligan and Higgins (2005) points out that role conflict and role ambiguity are instrumental in developing physiological disorders and says that the above factors can also lead to organizational dysfunction and decreased productivity. Deterioration of job performance due to lack of role clarity was noted by Fried et al. (2003).

Rizzo et al. (1970), defines the role conflict as the incompatibility of requirements and expectations from the role, where compatibility is judged based on the set of conditions that impact the role performance. The effect of role stressors namely role ambiguity and role conflict among the employees was studied by Tang and Chang (2010), who concluded that these role stressors affect the employees creativity. Stellman (1998) points out that role conflict and role ambiguity can be minimized by improving the interaction and communication between the supervisors and workers.

2.2.3 Career development

Lack of expected career growth is one of main source of work stress. The factors connected with this are poor promotion polices, job insecurity and poor pay in the organization (Sverke and Hellgren, 2002). Bosma et al. (1998) reveals that poor promotion prospects and blocked career may lead to work related stress hazard like coronary heart disease (CHD).
The study among twenty private and public organizations by Rehman (2008) shows positive correlations between job stress and job insecurity, but Witte et al. (2003) points out that job security is associated with reduction in job satisfaction and organizational commitment among the employees. Studies conducted among construction workers by Loosemore and Waters (2004) notes that poor pay increases the levels of work stress.

2.2.4 Decision latitude and control

Decision latitude and control are important aspects of work stress. They represent the extent to which the employees are participating in the decision making process, and also shows the freedom given to the employees for choosing their work. Park (2007) indicates that individuals with highest income group is most likely to have low strain due to greater job control. He further states that white collar workers have higher levels of decision latitude.

Based on studies conducted in a private sector organization in London by Bond and Bunce (2005) reveals that job control is the one of the important mediator for improving the mental health, commitment and absenteeism. Lack of control combined with too many job demands increase the likelihood of early retirement (Turcotte and Schellenberg, 2005).

Shields (2006) points out that work stress leads to depression among employees. The study further says that high psychological demands and low decision latitude leads to more work stress among women. Aras et al. (2001) found musculoskeletal problem like shoulder pain among the workers due to low job control and less possibility to discuss the problem with superiors.
Schaubroeck et al. (2000) suggests that higher job control will improve the coping ability of the employees at times of high job demand but Searle et al. (1999) noticed low job performance due to low job control. de Croon et al. (2004) suggests that improvement of working conditions like better job control can reduce the turnover tendency of workers.

The work stress factors like high work demand and low job control were analyzed among industrial workers of different age and sex by Kivimaki et al. (2002), and found that workers having high work demand and low job control had a higher cardiovascular risk compared to those who had lower stress. Similar results were found in the studies of Kuper and Marmot (2003), but the incidence of coronary heart disease (CHD) was noted more among the younger workers. The research works of Heraclides et al. (2009) reveal that, exposure to long term stresses resulting from low job control and high work demand leads to increase in the risk of type-2 diabetes.

2.2.5 Interpersonal relationship at work

A number of research investigations point out, the need for good relationship with superiors, support from the superiors, support from the colleagues at work for the elimination of work related stress hazards (Spielberger et al., 2003). Ben (2007) says that the real source of problems connected with work stress is not located in the work environment, but is person-based, and the most effective way to reduce stress is to change the person based factors. Accordingly a questionnaire was developed by Ben (2007) and circulated among the check out assistants in the age group 18 to 56yrs, who belonged to both sex. The study revealed that higher level of job demand and low level of support at work can cause job stress.
Bacquer et al. (2005) developed a questionnaire for the study of work stress among the middle age men and women working in large scale industries in Belgium and found that supportive work environment by coworkers and supervisors are required for the minimization of work related stress hazards like CHD. The effect of supervisor support at times of high work demand among the correctional officers in a high risk industry in Australia was studied by Brough and Williams (2007). The study pointed out that low supervisor support was one of the major reason for work stress.

Burt et al. (2008) studied the influence of co-worker support and supervisor support on work stress among the workers in a construction industry and found that the presence of the above factors could improve the group cohesion and team safety. The reliability of the questionnaire developed for the analysis was ensured before the administration.

Kjellberg and Wadman (2007) in his study among assembly workers at Sweden found musculoskeletal complaints among the employees and argued that low work support and work demand were more responsible for work stress rather than control.

Paschol and Tamayo (2004) developed a work stress scale for the evaluation of occupational stress, which can be used in different work environments and variety of occupations. The scale initially had 31 items and the scale was validated by means of factor analysis and the final version had 23 items.
2.2.6 Home – Work Interface

Many research studies point out the work related stress hazards due to work-family conflict. Yang et al. (2000) states that work-family conflict is a form of inter role conflict, in which the role pressures from the work and family domains are mutually non compatible in same respect. Jansen et al. (2006) examined the effect of work - family conflict among male and female workers and observed that work- family conflict leads to greater sickness-absence in men and women and this was more pronounced in women. Studies of Frone (2000) about the work- family conflict reveals that work family conflict leads to one set of psychiatric disorders.

2.2.7 Change

Change is one of the most commonly found stressor in the context of work. Conner and Douglas (2005) points out that changes in the modern work environment as result of technological advances, organizational restructuring and various redesign options can elevate the work stress. Shegemi et al. (1997) states that rapid changes along with poor relationship can lead to one set of work related stress hazards.

Launis and Pihlaja (2007) points out nine type of changes in the work place, which are creeping change, new managers with new vision, lunching of new data systems, weakening of individual position, service concept disputes, employment under threat, Changes as a coercion from outside , change as a starting point of new activity, change due to the new idea brought into the local work unit due to the arrival of new project. Most of the times such dynamics of transformations are not well understood by the employees. Such recurrent changes are found instrumental in inducing the work stress.
2.3 Research work on work stress in the content of work

Like context of work, content of work also leads to work stress. The following literature cited below discuss the research findings on the factors which lead to work stress and related hazards in the content of work. These factors arise due to improper design of the task, work load and work pace, and work schedule (Mackay et al., 2004; Cox et al., 2000).

2.3.1 Task design

There are several aspects of job content which are found hazardous and these include low value of work, low use of skills, repetitive work, uncertainty, lack of opportunity to learn, high attention demand, conflicting demand and insufficient resources (Cox et al., 2000). The research work shows that work related stress hazards arise due to meaningless task and lack of variety etc. It is also noted that most stressful type of works are those which have excessive demand and pressures, that do not match with the worker’s knowledge and abilities (WHO, 2007).

Many earlier studies point out that jobs with low degrees of autonomy and skill generally have ‘low need satisfying value’ for the individual and this results in low self confidence and affects the mental health (Handy, 1995). The studies conducted by Society of Human Resources Management UK among women and workers of age below 35 in 2005 showed that low value of work leads to low job satisfaction (WFC, 2006). But Chandola et al. (2006) points out that lower level of physical activity in the work often leads to work stress, meanwhile Leka (2003) notes that monotonous, under stimulating and meaningless tasks, unpleasant tasks, and aversive tasks are stress raising factors.
Bond and Bunce (2005) points out that repetitive work and task cycle time are responsible for work stress. A study of the effect of repetitive work was carried out by Lundberg et al. (1989) among assembly line workers and found that stress due to repetitive work leads to cardiovascular problems among workers.

### 2.3.2 Work load and work pace

Work load or work demand is one of the most important factors responsible for work stress. There are two different types of work load—qualitative and quantitative. Quantitative work load refers to the amount of work to be done, while qualitative work load refers to the difficulty in that work (Cox et al., 2000). Melchior et al. (2007) studied the effect of work stress among men and women working groups in the USA and found that high psychological work demands like excessive work load and time pressures lead to work stress and cause depression and anxiety among young working adults, but Levi (2000), noticed work related stress hazards like depressive disorders and abdominal fat among workers with high work demands. A higher correlation between work stress and coronary heart disease (CHD) was noted by Chandola et al. (2008) in his study among male and female employees of different age groups. It is noted that more association of CHD was found among the age group above 50 years.

Bosma et al. (1998) investigated the association between two alternative job stress models—the effort reward imbalance model and job strain model and the risk of coronary heart diseases among male and female British civil servants and found that imbalance between personal efforts (competitiveness, work related over commitment and hostility) and the
rewards (poor promotion prospects, and blocked career) was associated with coronary heart disease. Job strain and job demand are not related to heart disease. But Vrijkotte et al. (2000) suggested that work related stress due to high effort and low reward lead to increased heart beat and blood pressure. They also found that self reported chronic stress can be an independent stress risk factor for cardiovascular disease in middle aged men (Ohlin et al., 2004; Siegrist et al., 2002).

Wilkins et al. (1998) in their study notes that work stress is more among service and blue collar employees. The analysis of stress and strain among men and women revealed that among men job stress is significantly associated with migraine and psychological distress. Among women job strain was significantly associated with work injury.

Park et al. (2007) in their study among the Canadian employees of different age groups finds that younger work groups of age 15-24yrs always prefer to be in active jobs. The study reveals that 40-54yrs age group had higher perceived job stress than the younger work groups. But the studies among the north Italian employees by Cesana et al. (2003) on the age groups 25-54 yrs by using a questionnaire derived from the demand – control model of Karasek (1998) report that increased blood pressure among the employees while moving from low to high strain jobs. Mc Clenahan et al. (2007) conducted a study using demand – control / support model of Karasek and Theorell(1990) among academics and suggests that more number of variables are required for analyzing the work stress for a particular occupation.

Cavanaugh et al. (2000) conducted a study among US managers, by considering two types of work stress. The fist one is challenge-related
stress, which is due to time pressure, high levels of responsibility, job over
load etc and this leads to job satisfaction and the second one - hindrance-
related stress, which is due to organizational politics, red tape and concerns
about job security will leads to turnover.

A study of work stress among young workers of New Zealand done
by Melchior et al. (2007) shows that high physical demands had a two
fold risk of major depression and anxiety compared to those with low
demand. For this study data was collected from the participants through
interview method.

Work stress is found to vary with different places; de Smet et al. (2005)
studied the occupational stress among men and women working in two
different work centers namely middle European work centers and
Swedish work centers and observed that, men in middle European work
centers perceived marginally less work demand compared to women, where
as a reverse trend was observed in Swedish work centers. But Leontaridi
and Ward (2002) is of the view that physical demands of job involving
risk and hard work play a larger role in increasing the job stress levels.

The association of work stress with monotonous work, perceived
high work load and pressure were studied by Szabo and King (2000). They
also pointed out that the above factors can lead to work stress, which in
turn could lead to injury and musculoskeletal problems for the workers.
2.3.3 Work schedule

Two major factors responsible for work stress due to improper work schedule are shift work and long working hours. The studies conducted in Italy by Conway et al. (2008), among the shift workers observed that shift work leads to poor sleep and health related problems. The work stress was evaluated by means of effort-reward imbalance questionnaire, derived from Siergrist stress (1996) model. The reliability of the questionnaire was found satisfactory.

Shields (2006) observed higher job strain among shift workers than those people with regular hours of working. They have higher levels of psychological demands and lower job control and less job satisfaction. It has been also found that physically demanding work is one of the important factors for work absence among men and women (Park, 2007).

The study among fire fighters during night shift work shows that shift schedules, particularly night shift work often develops fatigue and induces heart rate variability (Takeyama et al., 2005).

Hirose (2005) studied the effect of work stress among women workers in dish factory in shifts. He points out that shift work often leads to sleep disturbances and causing fatigue. Higher level of blood pressure was observed among employees working in night shifts.

Yang et al. (2006) points out that long working hours develop work stress leading to hypertension among the employees. The study was conducted in California, among working population by interview survey method and found that on individual working 40 hours per week were 14% more likely to report hyper tension and those who worked between 41 to 50
hours per week are over 17% more likely to report hypertension and those who worked $\geq 51$ hours per week were 29% more likely to report hypertension.

Dewa et al. (2007) points the link between psychiatric disorders and stress. The study conducted in Canada among working professionals of different age and occupation levels shows that chronic work stress amplifies the effects of psychiatric disorders which leads to physical disability. Stressful working conditions like long working hours is found responsible for musculoskeletal problems and work injury (Dempsey and Filiaggi, 2006; Daraiseh et al., 2003). A similar study was made by Rinder et al. (2008), by means of epidemiological appraisal instrument.

Krantz et al. (2005) conducted a study among white collar workers in Sweden, and found that work stress is associated with men subjected to long working hours (75 hours/week) and it often leads to wide range of ill health in men and women.

Caruso et al. (2004) analyzed the effects of overtime and employee health among Japanese workers. The study shows that overtime work is associated with the risk of myocardial infarction, increased blood pressure, increased injury rates, unhealthy weight gain and increased alcohol consumption. The study also indicates that working twelve hours or more hours per shift was associated with increased risk of back disorders and gastro intestinal complaints.

Hung and Jiang (2009) developed a fatigue questionnaire to evaluate physiological fatigue due to long term web browsing and found that long working hours lead to fatigue.
2.4 Work stress and modelling

Several models have been proposed to explain the causes of work related stress. Frankenhaeuser (1986) and colleagues have described a model where stress is defined in terms of imbalance between the perceived demands from the environment and individuals perceived resources to meet those demands. This imbalance can be caused by quantitative (A very high work pace, too much work to do etc…) or qualitative (too much responsibility, problems too complex to solve, conflicts ,overload etc…). However, an interesting feature of this model is the postulate that stress may be caused by an imbalance caused by under stimulation .This situation can be found in monotonous and repetitive work, such as traditional assembly line work and in data entry work at video display units , and among people who are underemployed.

A well known model describing work stress or strain is the demand control model proposed by Karasek and Theorell (Karasek and Theorell, 1990) and developed and expanded by others. According to this model, the combination of high demands and lack of control at work results high job strain. High demand combined with a high degree of control, which characterizes many high strain jobs , are described as an active work situation and are not associated with enhanced health risks.

The demand control model has been tested in numerous studies, which in general , shows that occupations characterized by high job strain are associated with elevated health risks compared with low strain jobs. Although most studies are cross sectional, thus excluding the possibility of making casual interferences, the few prospective studies that have been performed reports similar findings. In recent years, a third dimension
‘social support’ has been added to demand – control model. High job strain combined with low social support at work contributes to even more elevated health risks. Social support is generally considered to be protection against stress at work or it serves as a buffer against health risks under stressful conditions.

Johannas Siegrist (Siegrist et al., 2004; Siegrist, 1996) proposed a new model for stress at work called the effort-reward imbalance model. According to this model, lack of adequate reward in response to the individual’s achievement is considered to contribute to high stress levels and elevated health risks. Reward could be in terms of economic benefits, such as higher income.

Work stress models have been proposed by a number of researchers earlier to explain the causes of work stress and many such causes are explained in sections 2.2 and 2.3. The main objective of developing the model is to find out the relationship between the variables responsible for work stress.

Factor analysis is the basic model and has received a lot of attention in the field for many years (Lee, 2007) and it is used to develop the relationship between a set of variables (Thurstone, 1945; Spearman, 1904).

Mackay et al. (2004), conducted a factor analysis for the management standards developed for the risk assessment and many researchers used the indices like Tucker-Lewis Index (TLI), Normed Fit Index (NFI), Comparative Fit Index (CFI) and Root Mean Square Error of Approximation (RMSEA) for the analysis of fit for the structural equation modelling (Harrington, 2009).
Chan (2005) developed structural equation model for work stress. In this, association between different variables—namely stress, health, work, family and finance were analyzed by means of this model. The structural equation modelling was done by means of confirmatory factor analysis.

Forgarty et al. (1999) indicates that age and gender are important conditions influencing work stress. The study employed a path analysis to examine how occupational stressors, coping resources of the individual and characteristics of the individual-negative affectivity and positive-affectivity predict occupational strain. Further structural equation modelling was done linking negative-affectivity, positive-affectivity, coping resources of the individual and job satisfaction.

Kouvonen et al. (2005) developed multinomial logistic regression model, for examining the association between work stress and smoking intensity among Finnish public sector employees and found strong association between smoking and job stress.

Lindblom et al. (2006) examined the relationship between psychosocial work stress factors like work content, work load and social support and job burn-out, by means of multinomial logistic regression, which is capable of handling more than one outcome.

2.5 Observations from literature review

The literature review shows that work related stress is common among the employees throughout the world. It has been found that quantitative work demands which are considered to be an important source of stress, are concurrently affected by two reverse trends: a positive one—shorter working hours which would likely to reduce stress, and a negative one—greater work intensity, which generates higher stress levels.
Low job control is recognized as another important source of stress and many other research studies show that low support from superiors and colleagues are the main source of stress. Large number of studies indicates that strained relationship at work, role ambiguity, role conflict, inability to adjust with the changes in the production system result in work stress. Another sources of stress is harassment, where large number of workers report that they are subjected to work place harassment and bullying.

Many studies show the variation of work stress intensities among different age groups, but irrespective of age, employees report that work stress affects their health. Work stress is found in all sectors like, health, agriculture, forestry, manufacture and service. Studies show that work stress exists among employees in private and public sector. Work stress is prevalent in both white and blue collar employees. Well being scores for the self employed workers were found lower than employed workers. Among employed workers, the type of employment contract affects the stress related indices. Among the four contract types-permanent contract, fixed term contract, temporary contract and apprenticeship, workers with permanent contracts displayed higher stress levels.

From the literature review presented above, it is evident that studies on work related stress leaves scope for further research. Most of the studies in work related stress are carried out in developed countries, where researchers used either already existing standards or developed new factors for the evaluation of works stress. But in developing countries like India, well defined standards are not currently available for the evaluation of work stress.
Literature review reveals further that the factors used for the evaluation of work stress are different in different countries. Most of the studies are identical in nature. Therefore proper identification and development of factors for the evaluation of work stress are essential, which can be applied to Indian Industrial environment.

Although most of the reported research works are conducted according to well accepted methodology of scientific research, little consensus has been reached in certain aspects commonly associated with work stress. The researchers have used different questionnaires, resulting in different factor structures. The questionnaires that have been used were naturally influenced by authors’ perception about the ‘relative importance’ of the questions.

While developing questionnaires by using different standards for the evaluation of work stress, very few researchers have attempted to support their claim by reporting an indication of its construct validity, unidimensionality or predictive validity. Most of the efforts have not progressed beyond the stage of face validity.

It is found that “risk assessment” has emerged as the principal factor in many studies. Since this assessment contains various factors developed by different researchers, identification of deficiencies in each standard has become difficult from their studies.

The modelling of work stress was done by several researchers using factor modelling, structural equation modelling and multinomial logistic regression modelling on different stress factors. As these standards are totally influenced by the work environment and work culture, general conclusions cannot be drawn from this.
2.6 Motivation for present research

Considerable research has been done on work related stress in developed countries like USA, European Union, Australia, Canada etc. But little research is done in India so far in this area. The review of the literature shows that various factors/risk assessment parameters developed so far can be effectively used for the work stress. But in India, where the work environment and work culture are different from the rest of the world the research work in this area is found to be meager. Hence it is worth while to develop factors/risk assessment parameters for the evaluation of work stress.

Empirical investigation of relationship between the factors responsible for work stress and the determinants are necessary for decision makers to give evidence and scientific explanations to support their decisions. The literature review reveals that enough such studies have not been reported not only from India, but also from developed countries.

Most of the scientific research in this area clearly shows that the factors responsible for work stress changes with age, designation, and experience. But little research has been done among people of different designation levels and experience in the same organization. Therefore it will be useful to analyze these factors in industries. As factors differ in different work environment, it is advisable to extend the analysis of factors among chemical and heavy engineering industries.

Apart from studying the parameters influencing work stress in industry, it is important to compare the effect of these factors in other similar organizations by cross comparison. Such type of study is not reported from India as well as developed countries.
The factor modelling of work stress by alpha factor analysis is seldom found in literature. Such type of modelling by using the factors developed for the study will help in establishing relationship of the factors with work stress, which can be used in Indian industries for prediction of work stress.

Most of the structural equation models on work stress reported from developed countries show the relationship between the various factors and work stress. Since the factors are totally dependent on the work environment and culture, it is worthwhile to develop such a model suiting the Indian work environment.

Multinominal logistic regression models for work stress has been done only in developed countries. Most of the analysis is based on either age or gender. But studies on improvement in work stress due to unit increase in these factors among different designation and experience groups is not found in literature. Hence it is important to carry out such studies to predict relative increase in work stress among different groups over the reference group.