ISSN: 2277-9655
Impact Factor: 3.785

IJESRT

INTERNATIONAL JOURNAL OF ENGINEERING SCIENCES & RESEARCH TECHNOLOGY

EFFECT OF OCCUPATIONAL STRESS IN INDUSTRIES

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DOI: 10.5281/zenodo.52044

ABSTRACT

Stress may be defined as a situation where in factors interact with a worker to change (i.e. disrupt or enhance) his/her psychological and/or physiological conditions, such that the person is forced to deviate from his normal functioning. The stress affects the operators in terms of tension, frustration, sleeplessness, anxiety, burden and some time pain. In this paper it is emphasized that stress should not always be considered as an undesirable or negative aspect of life. The right amount of stress is positive because it provides the necessary drive. Face daily challenges eventually succeed. Stress becomes negative when it goes beyond the copying capabilities of the individual.

KEYWORDS: Occupational stress, Psychological Manifestations.

INTRODUCTION

Every individual uses energy to sustain life processes, to labour for a potential level of self development and encounter the constant demands of daily existence. Stress can be defined as the energy state of individual as he responds to the internal and external demands placed on him.

Stress is vital for existence. Performance of workaholic personal is higher than the unemployed or retired persons. (4thSafety Symposium, 1989) The word `stress` is derived from a Latin word `stringere` which means to constrict or to tighten. Over the years this definition has been expanded to mean pressure strain, tension, anxiety, frustration, apprehension, burden and some time also pain.

Recent research on occupational stress has led to formulation of several theories about the factors that affect stress. Stress may be defined as a situation wherein factors interact with a worker to change *(*i.e. disrupt or enhance) his/her psychological and/or physiological conditions, such that the person is forced to deviate from his normal functioning (Beehr and Newman, 1978).

It is in these contemporary dimensions that stress is going to be considered here. It is important to regard `stress` as a process rather than a situation. When someone is subjected to stressors-stress causing factors- the persons starts to undergo a process with a ultimate hope of overcoming and surfacing back to the `steady state` which is considered as the normal. The stressors may be of an internal origin such as biological and psychological or of an external origin such as of sociological/ environment and development nature.

When someone is exposed to stress, his response depends upon physical and mental condition which vary from time to time and person to person. Furthermore, sometimes one can perceive stress stronger than it really is and subsequently over-react accordingly.

One should be able to analyze realistically and be capable of regarding things as actually are and not magnify them through one`s own imagination. This unrealistic condition can affect the human body in the same way as any other stressful situation which might result in disturbances of digestive system. Intestinal over activity is a predominant

symptom of emotional stress. The stomach, which is the reservoir of food, becomes, more susceptible to ulceration and can lead to what are known as `stress ulcers`. Blood pressure can increase and directly affect the heart showing in high pulse rate and if uncontrolled can lead to heart trouble. The kidney and the brain can also be affected and can show in kidney malfunctions and cerebral vascular accidents (stroke etc.) respectively.

The majority of words workforce does not have access to occupational health services. Only 5 to 10 percent of workforce in developing countries and 20 to 50 percent of workforce in developed countries have access to some kind of Occupational health services (Tetsuya Mizoue, 1999). Small and medium-scale industries employed about 80% of workforce and contribute over 90% of all industries in developing countries. Workers in these industries are at greater risk of work-related injuries, chronic illness, stress, and disability or death because of low educational and literacy rates, unfamiliarity with work process and exposures, and inadequate training (Park, 2001, Faris, 1998).

Individuals normally try to cope with stress by smoking or increase smoking, which apart from damaging the lungs, increase the acidity of stomach and subsequently increase the chance of stress ulcer. Some people resort to alcohol which instead of decreasing the tension and anxiety, damages the brain, the blood vessels and the stomach and the liver in particular.

The stress can vary from individual to individual and also vary in their gravity. The general medical and psychological manifestations of stress are as follows:

1. Sleeplessness
2. Lack of appetite with weight loss
3. Asthma
4. Headaches
5. Skin changes/rashes
6. Backaches
7. Dizzy spells
8. Gastric ulcers
9. Shoulder and neck pains
10. Heart troubles
11. Palpitations
12. Difficulty in concentration
13. Fatigue
14. Depression
15. Aggressive behavior
16. Anxiety
17. Lack of interest
18. Solitude

The long term effect of stress in different body parts i shown in fig. 1.

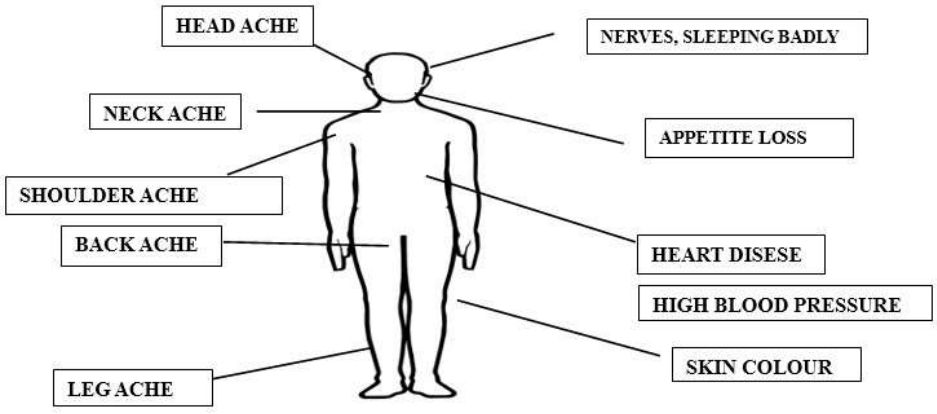

Figure 1 Long Term Effect of Stress

ISSN: 2277-9655
Impact Factor: 3.785

OCCUPATIONAL STRESSORS

When we talk about stress it indicates a change, a change to the worse of the change to the better but a change from the previous routine, or steady state it is also important to note that although a change can be welcome one it is still construed as a stressor. Change in the routing of your lives even welcome.

Once, can be stressfully, both in terms of the way a particular perceives them and even in death that occur during the following 12 months.

Individual's response to stress differs and therefore a person reaction to a change is not uniform these values indicate only a relative impact of stressful events nowadays one can deliberately say that in today's working environment there is no room for survival of the fittest but more ever it is more a question of survival of the most adaptable. Therefore to survive, one has adopted and to adapt one change it stressor.

As already stated, change is major stressor and personnel working in petrochemical industries are constantly being subjected to change. A major contributing factor in this regard is the working schedule.

Most of such workers spend a period of time with their families and then abruptly are isolated in a considerably unusual working environment the distinction between these two ways of life can construe a major stressor to certain individuals. While on the one has a family atmosphere where affection and other similar sentiments are normally predominantly present on the other hand there is the other situations of a predominantly masculine environment were toil is the major happening of the day. In the most industrial environment personnel work for loan working hours and have no weekend breaks during stretch. Therefore the worker is subjected to a condensation/concentration of happening which is another working environment would be spread over a longer period.

It is important to consider that over the years. The structure of human body anatomically and physiologically, remained basically the same. This cannot be said for the environment in which man had to live. It changed through the year and there is sharp contrast between today's environment and that of say two thousand year ago.

Today we are living in an industrial environment which can be considered as antagonistic to the body's natural response to stress which over the years always was the fight or flight syndrome the hormonal and chemical defense mechanism explained above reminded the same over the year bit the life style changed and today's society denies us the nature; safety relief valve to be engaged in case someone is faced with a stressful situation. The release of stress build-up in about physical activity such as smashing the telephone assaulting the boss or even an explosive verbal outburst of what one thinks of an impertinent colleague and other similar acts, are not allowed by today's lifestyle.

Capel and Guernsy (1987) in their book 'Managing stress state in polite society' stated that we are even denied the relief of swearing of nature's more effective and harmless mechanism for relieving stress. Even though such liberal statements can be contested, it indicates the impractical concentrations that we are imposing on our body which eventually can lead to build up of internal pressure which is potentially dangerous and damaging at the same time nature's response to stress in physical activity is disallowed. Obviously this aggravates the stress situation by making the person feel in an inescapable situation with the eventual noticeable symptoms such as excitability boredom, depression and lethargy.

As already mentioned above, personalities differ in their approach and coping capabilities towards stress. There are persons who explode at the first sign of destruction, while others regardless of the gravity of the situations remains cool and calm.

Researchers of this matter normally list these types of personalities as Type A and Type B behaviors are shown in table1 (4th safety Symposium, 1989):-

ISSN: 2277-9655
Impact Factor: 3.785

Table 1 .Type A and Type B Behaviors

Type A	*Type B*
Competitive Achiever Fast Working Aggressive Impatient Restless Hyper-alert Explosive Speech Feeling under pressure	Relaxed Easy going Seldom impatient Outside interests Work stability Difficult to here to Plenty of time Less restless Less preoccupied

Normally these two types of personalities interact and we don't find them so distinct. There are persons who can be, in -between these two extremes.

Stress should not always be considered as an undesirable o negative aspect of life .the right amount of stress is positive because it provides the necessary drive to go on and eventually succeed stress can be vital and positive and provides the force to face daily challenges. Stress becomes negative when it goes beyond the coping capabilities of the individual.

ON THE OTHER HAND, STRESS CAN BE CUMULATIVE

The stress factor in chemical and other related industrial personnel should be regarded in its complete perspective .it should be considered in relation to the other stressors Of our daily life and evaluated on the prevailing environmental background Sometime it could be the case that the stress level of a working environmental is positive but when Superimposed on the other stressful factor outside work sociological and environmental it makes the stressors such as material relationship, financial situation etc.

It is important to consider and compare the stress level in similar personnel against other occupations. Occupational stress rating (Cooper, 198) reproduced partly to give a clear picture of these personnel position in different occupation (table 2).A section of the cooper occupational stress rating table compares the stress factor in various industrial productions and from this it is evident that these industrial processes which in valve risk and danger are classified as an extremely stressfully job.

Table 2. Industrial productions (Extract)

Food Technology	4.0
Printing	5-6
Textiles/Clothing Technology	4-5
Timber Furniture	4-3
Mining	8-3
Construction/building Extremely stressful job Very stressful job	7-3

Six experienced stress researchers independently evaluated each job on a 10 point scale, from least stressful (1) to most stressful (10) each score represents the mean average of these ratings.

Normally, sources of are not too distinct. It could more difficult to delineate between the general of stress and the stress doe to work i.e. Occupational stress in real life the demarcation line between these sources is not so distinct, general occupational stressors can include but are not limited to:

- Role ambiguity
- Relationship at work
- Job security
- Role conflict
- Work overload/under load
- Job Un satisfaction

The following occupational stressors are going to be discussed in some detail because they relate directly to the industries:

- Stress due to excessive noise levels
- Stress due to extremes of temperature
- Stress to the family detachment
- Stress due to long working hours
- Stress due to the presence of risk and danger

Noise

Noise is being unwanted sound can easily can easily be overlooked as a potential stressor exposure to noise. Especially high pitched level noise is associated with fatigue, headaches irritability; excitability and inability to concentrate furthermore physiological effect of noise can demonstrate in loss of heating aural pain and sever exposures, even nausea. Subsequently noise increases the vulnerability to accident. Short sudden exposure to high noise outburst (Air Compressor) is considered much more detrimental than a constant noise of same pitch.

Matteson and Ivancevich (1987) state that noise can be considered less as a stressor in situations where it is excessive but expected than in situations where it is unexpected or unpredictable. The abrupt variations in noise levels seem to create an unbearable stimulation of the auditory nerve which especially in industrial environment and in the presence of other stressors can cause a serious aggravation of a stressful condition.

Noise is produced by many different industrial activities from various type of machinery such as air compressors, generators etc. used in these environments. The noise generated by similar other planets varies in intensity. Character, location and time span. There may also be a of these factors which obviously exasperate the situation. Noise can be increased to a hazardous level by reverberations from reflecting surface and special care should be exercised when using equipment in confident spaces e.g. in taken to reduce noise when several items of equipment that may be relatively quite when in use singly are to be used simultaneously, avoid hazards to users and to persons working in the vicinity.

In this particulars context of noise we have to differentiate between noise as a vibration of sound waves through solids, liquids or gases and mechanical vibrations which can also be considered as an occupational stressor. Mechanical vibrations can form a very powerful stressor.

Vibrations from rotary machines, heavy diesel engines impacting machines as used in rock cutting, and pneumatic drills can lead psychological and neurological impairment. Vibrations that transfer from physical object to the body may adversely affect performance in such in stances the hands and feet are most commonly vulnerable for the simple reason that these are the parts of the body which are in direct contact with the vibrating surface and eventually they are providing a buffer for the body torso. Workers who operate vibrating hand tools or similar risk developing peripheral nerve disorder and ‘white fingers’ (Kindenberg et al.,2006).Exposure to large amount of vibration in a localized area, such as the user’s hand over a prolonged period of time might increase the risk of chronic disorder of the muscles, nerves, and tendons . Other studies have shown vibration to cause temporary sensory impairments (Streeter, 1970).

The conditions of occupational stress due to mechanical vibration can be physiologically proved by the increased catecholamine levels in the body the major considerations in such a condition are more psychological and can show in general irritability general apprehension, loss of temper and other similar erratic behavior.

On offshore installations, especially fixed unites, vibration is considered as a powerful potential stressor in the initial phase of the drilling programme the hammering action generated by the drill floor vibrates throughout the whole installation. Similarly this can be attributed to the activity helicopters landing and takeoff on helpdesks which normally are located nearby the accommodation areas if not on top of it.

Most personnel subjects to these conditions, especially in resting hours find these mechanical resonance intolerable and contributing towards general fatigue mainly due to the interference with the relaxation of time which is extended for complete resting and eventual energy accumulation for the subsequent working phase personal working in such environment normally are working long shifts for example twelve hours on and twelve hours off for a whole working Rota which can vary from weeks to week up to six week and sometimes more therefore these people are subjected to these conditions for a considerable amount of time without any remission although one can be tempted to contemplate that one gets used to it this is not to the case because to survey on and two weeks off, forty percent of the workers consider vibration as an Occupational stress and make the working conditions Unpleasant.

Mechanical vibrations can also cause what is known as deeds are known as white fingers conditions are brought about by the fingers being subjected to any mechanical vibrations such as when used by the guide a cutting tool. The circulations in this hand become impaired and when expressed to cold, the fingers become white and lose sensation as in mild frostbite. The condition usually disappears when the fingers are warmed for the same but advanced case can be disabling and affected workers are forced to seek other type of work.

A similar conditions is what is called repeated motion diseases. This affect personnel subjected to repetitive moments as found in sorting and assembly lines where there is a repetitive motion. It is also caused by repeated excessive strain. In these conditions the underlying cause is irritation and inflammation of the tendon sheath of the hand and arms. This condition is generally known as tenosynovitis and once established it is painful and disabling this condition is caused by excessive repeated strain and its prevention is, obviously, much more satisfaction than treatment.

TEMPERATURE

Nowadays in most working environment the ambient temperature can be controlled in order to provide a suitable working temperature to employee. However these are areas where this cannot be done and subsequently the worker is subjected to a hot or cold environment.

Matteson and Ivancevich (1987) state that excessive heat is a potential stressor likely to generate both physical and psychological disturbances, particular to those engaged in heavy physical activities. As it is going to be indicated later, physiologically heat stress result in increased blood flow and heart rate, higher oxygen demand and lower fatigue levels: psychologically it can disrupt normal effective functioning and greatly increased irritability. Roughnecks, roustabouts and drilling crew on offshore rigs especially in north seas during winter and exposed to very low temperatures apart from getting wet for long hours due to the nature of their work. On the other hand the same categories of workers on a drilling rig in the desert are exposed to very high temperatures, especially in summer. Between there are industrial personnel who are exposed to both temperatures extreme over a short time period. Kitchen staff who spend most of their time next to heat of open temperature when the retrieve their goods from freezers and cold stores. The same can apply to engine room crew who spend most of their time in engines rooms and in nearby areas which have a relatively high ambient temperature but these personnel have to carry out their duties on deck as well and this then offers them a good contrast where the temperature lag is remarkable.

Prolonged exposures to cold heat are major stressors wearing protective equipment as it is necessary in certain work environments. Can protect against the adverse effects of heat. But it also hinders heat dissipation from the body which is generated by physical activity. Thick clothing and protective equipment increase the word stress considerably especially when worn foe a long time. Apart from its weight and interference with body movements it impairs heat dissipation which is needed to keep body temperature with in allowable degree. This can easily lead to loss of body

fluid which is extremely needed in such physically demanding work. This also leads to accelerated fatigue heat stroke and heat exhaustion.

It can also impair the cognitive functions of conscious mind such as feeling and other fine motor skills problems. Sweating should be considered as an evaporative bodily cooling process. It should be remembered that under warm conditions the body sweats profusely. But in warm humid conditions sweating is impaired and subsequently the body temperature rises. The table 3. Shows the heart rate response to a mild exercise but in the form of level walking at approximately 8-10 kilometers an hour. The last twenty minutes are the recovery period after the exercise.

The only difference in two exercises is the type of clothing put on in the initial exercise a light propylene full body cove all and in the last exercise a full tunic. It is clear to appreciate from this demonstration how body ventilation affects the heart rate and the body in general.

Table 3 Influence of Ventilation on the Heart rate

Time: 0	10	20	30	40	50	60	70(mins)
H.R.: 78	88	100	145	150	148	108	82(L)
H.R.:96	108	124	160	176	198	132	118(H)

H.R. - Heart rate per minute L - Light clothing; propylene cover-all, heavy clothing; fire tonic.

The thick impervious clothing interferes with the dissipation of body heat generated by physical activity furthermore the layer of air trapped inside the suit heats up and becomes saturated with moisture no body evaporate cooling can take place because of the imperious clothing. This will lead steadily to a complete physiologically stress in the form of exhaustion with high rates and high body temperatures (4^{th} Safety Symposium. 1989).

PROLONGED FAMILY DETACHMENT

Most of the workers employed in industries; work on a rotational alternating field work periods with field breaks. Obviously this is necessary due to the location of he work site as it does not permit the employee to travel back home every day. Different companies works different with schedules i.e. number of days off work sites. The work schedule varies as well as from country to country in the offshore industry, most often the working Rota is equal time on and off, for example twenty eight days on and twenty eight days off. North sea rigs normally work a shorter tour of work two weeks o ad two weeks off or, even nowadays, two weeks on and three weeks off, following series of mishaps in the North Sea and also due to pressure on companies management from unions, the present tendency is that the off-site rest period is getting longer than the work tour.

On land rigs and oil refineries normally the work tour is longer than the off-site period. furthermore the on-site can last up to two months .although this types of working schedule seems tempting to personnel not employed in this industry, and as spectators will consider this as a, bonus that comes with the employment package, it offers, never the less, a great change, as indicated earlier change whether welcomed or not provides a certain amount of stress. Personnel employed in this industry can vouch for the feeling that they experience on both occasions of the drastic change i.e. traveling from home to work and vice versa. The last day of field break, at home usually is a wistful one full off of depressed. On the hand the day of traveling back home gives the feeling of as if one was escaping from person. A feeling of liberty, in fact if one analyses workers purview during a particular work tour, normally one finds as the days pass, the feeling of imprisonment increases. Towards the end of the work site period, workers tend to get nervous, temperamental and even aggressive. It is also a fact that the rate of accidents in this particulars period of a work tour is higher than the reminder of the trip. The most vulnerable time for someone to feel lonesome is normally a faster working hours, as long as someone is busy with his job and accompanied from thinking of sweet home. When

the work day is over and a person finds him alone in his room, a sense of solitude and a isolation can make him feel depressed and gloomy. Workers in these conditions tend to find refuge in excessive smoking and / or abuse of alcohol. This can seriously aggravate situation by adding to ill effect of these habits. It is important that this particular time is occupied by healthy activities. In most of petrochemical installation one can find various type of sports facilities on can spend a considerable amount of time in refreshing activities which inherently are very positive to maintain a good physique and also indirectly help keeping you away from the dullness of a solitary room. In the study off shore oil rings workers, it showed clearly that the longer the work side duration is protracted (though on equal time on and off) the greater is the stress induced. Furthermore the study as anticipated established that married workers with a stable relationship where more vulnerable to mental and physical ill health. Moreover it was further proven that where children involved the situation can proved more difficult to the further-workers.

LONG HOURS

Workers in this particulars industry, frequently work for long hours sometime twelve hours daily for even more with no weekend breaks. If a person is working twenty-eight day off, this means that over a four week period he is working a total of three hundred and thirty-sixth hours, same amount of hours that another workers working on eight hours a day on five day week would do in a period of eight weeks therefore it is reasonable to state that such workers are exposed to a concentrated amount of stressor over a short period.

This eventually show in the health of the individual various research studies on this matter showed a direct relation in increased coronary heart diseases in workers working long hours. In fact a research in us found that individuals under forty-eight hours a week had twice days of death from coronary heart diseases. It was also established that forty percent of young coronary patients worked for more than sixty hours a week (4^{th} safety symposium, 1989).

RISK OF DANGER

As shown earlier, an occupation which has a factor of risk and danger is considered as a stressful occupation the notion that a particular job is hazardous. Is a stressor in itself? Personnel employed in this type of industry are constantly aware of this positional hazard and therefore the worker is in a constant state of alarm or, arousal it has been already explained that when someone perceives a threat instinctively he goes in state of alarm and prepares to respond by fight or flight syndrome. Therefore in such situation the alarm state is being prolonged and protracted as long as the potential hazardous situation is going to remain. In this particular type of industry this can take up days add week the side effects off high adrenaline in the body changes in the respiration, muscular tension etc, therefore are prolonged as long as perceived threat is present. Undoubtedly this can have serious health problem for such workers.

THE COPPING PROCESS

It is vital to cope with stress. It is said that if stress is the rain of life coping is the umbrella. Coping refers to behavior that protects people from being psychologically harmed by problematic social experience, a behavior that importantly mediates the impact that societies have own their members (pearlin and schooler, 1978). Sometime it could be difficult to implement the copying in a stressful situation the six method which people commonly adopted to cope with work stress are measured:(i)social support (the degree to which individual rely on others as a means of coping with stress); (ii) task strategies (ii)logic; (iv) home and work relationship; (v) time; (vi) involvement. Coping with stress can take various forms and each individual should be able to pick the most applicable one of his condition. The following guid3es can be helpful

- See the reality of the situation
- Be practical
- Analyze the situation
- Asses the stressor and try to do something about them
- Don’t be shy to ask for help
- Don’t expect miracles try to put a sincere
- Effort in order to overcome any stressor
- Look at the promising side of things
- Be optimistic with regards to our occupation
- In your spare time to take life calmly and easily

- Be try to distract your attention worries
- Try to be the B type
- Learn to relax. It is important that after a hard day's work one spends sometime relaxing in the most relaxing way which fits you.

CONCLUSION

The increase of occupation stress and its effects on employees can be assumed when considering the due to this ailment. The Table 4. Indicates the increased percentage of absenteeism due to stress related illness over a period 24 years: 1955 to 1979.

Table 4 Percentage of Absenteeism Due to Stress Related Illnesses (Cooper et.al., 1988)

Diagnosis	Increase%
Nervousness ability, headache	528
III defined symptoms	101
Psychoneuroses and psychoses	49
Heart diseases	134
Other forms of heart diseases	38
Hypertensive diseases	123

It is with these figures in mind after evaluating the increases in occupational stressors due to various contributory factories discussed above, one have to establish if it is indispensable to introduce some measures in order to mitigate a particular situation.

Some time ago it could have been case that one could afford to subject industrial personnel to various type of stressor without any detrimental effect on their health. Nowadays the input of stressor from external sources i.e. Non occupational stressor such as material social environment etc. Have greatly increased and therefore are taking a greater share of the total allowable threshold at the expense of stressor.

Subsequently it is earlier nowadays to achieve the burning stage of an individual than before. In this one has to reconsider a whole programmed of operation and confirms it to fit appropriately in today's requirement and demand.

It is fact occupational stress can lead to serious illnesses and it is also implicated with the rise in use abuse of alcohol rugs, tobacco, and food it is also a fact that the social environmental contribute factor to occupational stress have increased in the last few decades at the expense of the workers health and well being. Therefore it is obvious that in the process of the continuous development of the workforce from recruit to retirement stage occupational stress should receive in an active type of support through it is also important that if needed these personnel should be provided with an programmed ordered to perceive problem posed by stress and eventually limiting their worst these effect these programmed are also needed to help in the identification of the problems as eerily as possible and subsequently to help in the copying process. Stress should not be considered as a weakness on the part of the sufferer stress management programmers should aim at eradicating this false impression. Such a programmed should be orientated for the industrial personnel and it should be include:

- Introduction to stress
- Source of stress
- Stressor interaction
- Vulnerability to stress
- Physiological changes in stress
- Manifestation of stress
- Treatment of stress
- Adaptation
- Coping
- Counseling

These training programs should also highlight the major aspect of the management type induced stressor such as

- Excessive autocracy
- Lack of proper communication
- Lack of counseling skills
- Lack of personnel respect
- Unfair criticism
- Scapegoating

Unfortunately some people think that if they opt to implement such program then they are admitting that there is a stress problem within their organization and they construe this as a failure of their management role. In my opinion this is an unpractical approach to very sensitive conditions of their colleagues. It is of paramount importance that organization main assets - the employee are cared for and safeguarded against occupational stress, as much as is practically possible. Since most organizational psychologists now accepts the importance of environmental and situational factors as determinants of behavior (Robbins, 1993), we suggest that an organization can assist in this process by fostering a culture that is more collaborative than competitive.

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