



PROTECTING WORKERS  
Health Series No. 6

# Raising Awareness of Stress at Work in Developing Countries

A modern hazard  
in a traditional  
working environment

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Advice to employers and  
worker representatives



World Health  
Organization

Protecting Workers'  
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# Raising Awareness of Stress at Work in Developing Countries

A modern hazard in a  
traditional working environment

Advice to employer and worker representatives



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## PREFACE

This brochure on work-related stress in developing countries is part of the 'Protecting Workers' Health series'. It is published by the World Health Organization (WHO) within the Occupational Health Team. We thank TNO Work & Employment in The Netherlands, a WHO Collaborating Centre in Occupational Health, for authoring the booklet as part of the Global Workplan of the WHO Collaborating Centres in Occupational Health.

The purpose of this booklet is to raise awareness for employers and worker representatives of work-related stress in developing countries. Work-related stress is an issue of growing concern in developing countries due to important developments in the modern world; two of the most significant being globalisation and the changing nature of work. Raising awareness at an early stage seems all the more important because work-related stress is also a problem which is far from being resolved in developed and industrialized countries.

Although the focus of this booklet is on developing countries, the problem of work-related stress is also significant in countries in transition who are subjected to rapid and drastic economical and social changes (for example in Russia), where there is an increased demand for adaptation of workers, the over-riding of traditional values, the re-orientation of the occupational health system, and generally poor working conditions. Traditionally, the focus of Occupational Health and Safety initiatives is on chemical, biological and physical exposures, while the psychosocial risks at work are still largely neglected and their causes and consequences still insufficiently understood as they pertain to the developing country context. The current division between working conditions and the (physical) work environment makes the inclusion of the psychosocial risks at work harder to identify by most of the Occupational Health and Safety professionals.

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## Chapter 1

# INTRODUCTION TO THE PROBLEM

Work-related stress is a pattern of physiological, emotional, cognitive and behavioural reactions to some extremely taxing aspects of work content, work organisation and work environment. When people experience work-related stress, they often feel tense and distressed and feel they cannot cope. Due to globalisation and changes in the nature of work, people in developing countries have to deal with increasing work-related stress. In industrialized countries people are becoming more familiar with what work-related stress is and how to manage it (e.g. WHO, 2005; WHO, 2003), however, in developing countries, this may not yet be the case. Although some research has been conducted in developing countries, particularly in Latin America, there are still not enough in-depth studies to fully analyse both cultural differences and behaviours which vary from one country to another. Along with existing difficulties in controlling other more well-known occupational risks, there is a lack of awareness of work-related stress, and shortage of resources to deal with it.

Cultural aspects may need some attention when dealing with work-related stress in developing countries. For example, spirituality and religion, next to community rituals are often more important than acquisition of material possessions or money. For women workers, social resources for taking care of their families are usually available in the formal economic sector. However, resources for the daily life logistics are not updated with the technology applied to community and private services in most of the developed countries, such as payment of bills by mail, phone or internet. Even when this type of service exists in some countries, the majority of workers do not have access to them. Therefore, daily routine tasks can be time-consuming and daunting.

The level of development in most of the developing countries implies drastic differences between urban and rural areas in the availability of resources, income and jobs. Globalization and commercial agreements with developed countries and the World Bank

rules have resulted in a decrease in investment in agricultural activities. As a consequence, along with the population growth, the offer of labour in urban and suburban areas, where industry and services settled, increased enormously. On the other hand, deregulation has also been the requirement during the globalization process, which has been translated into less protection of worker's rights, particularly health and retirement benefits, as well as less job security. As a result there is increased unemployment and under-employment and people accept substandard jobs.



Additionally, it is often the case that power in institutions and companies is unequally distributed. Furthermore, for individuals in developing countries, context often plays an important role in determining their perception, attribution and behaviour and it is often believed that the cause and control of outcomes is determined by external circumstances. Such cultural aspects influence what people *perceive* as good working conditions. When the only choice is to accept authority or to lose one's job, workers often accept sub-standard working conditions, because they know it is an employers market.

In developing countries the largest part of the workforce is self-employed, occupied in small companies and home industries. They belong to the 'informal sector' of the

economy. These companies or individuals often lack the resources and infrastructure to protect their workers or themselves from work-related stress and their groups of workers are difficult to reach both in terms of information dissemination and assistance. In addition, the lack of policy development in relation to psychosocial risks and work-related stress makes it difficult for companies of all sizes to put into place effective control strategies to deal with these issues. The situation is made worse by the lack of occupational health services coverage. WHO estimates that worldwide only 5-10% of the workers in developing countries and 20-50% of the workers in industrialized countries (with a few exceptions) have access to adequate occupational health services (WHO, 2003). Work-related psychosocial issues are rarely dealt by these even where they are available.

Work-related stress in developing countries is often made worse by a broad spectrum of factors outside the work environment from gender inequalities, poor paths of participation and poor environmental management of industrial pollution to illiteracy, parasitic and infectious diseases, poor hygiene and sanitation, poor nutrition, poor living conditions, inadequate transportation systems and general poverty. Overwhelming problems linked to globalization are unemployment, under and self-employment, precariousness of working conditions due to new systems of work organization and liberalization of the industrial relations. Globalization has led to growing inequality and decreasing prioritisation of social aspects in many parts of the world.

As mentioned in the preface, the purpose of this booklet is to raise awareness of work-related stress among employers and worker representatives in developing countries, which is an issue of growing concern due to important developments in the modern world, two of the most significant being globalisation and the changing nature of work.

This booklet focuses on :

- the effects of globalisation processes and the changing nature of work,
- a model and definition of work-related stress,
- how to manage work-related stress, and
- considers possibilities for action by stakeholders (employer and employee).

## Chapter 2

# EFFECTS OF GLOBALISATION AND THE CHANGING NATURE OF WORK

Globalisation is defined as “an increase in the total world economic activity as a consequence of the liberalisation of trade and the elimination of the hindrances to the transfer of capital, goods, and services across the national border” (Rantanen, 2000).

Effects of globalisation are seen at the international and national level as follows:

### **At the international level :**

- increased economic transactions
- increased foreign investment, and
- increased world trade - giant multinationals, such as in the insurance and banking sector, manufacturing, oil and raw material producers are key operators in this process of globalisation.

### **At the national level :**

- fragmented companies and smaller independent decentralised units
- outsourced activities to smaller units
- more flexible work organization.
- more flexible industrial relations (specifically contracting agreements).

“Globalisation has led to growing inequalities and down prioritisation of social dimensions in many parts of the world” (Rantanen, 2000). In other words, globalisation and deregulation has resulted in increasing the gap between the rich and the poor, and in excluding and marginalising the general worker, particularly in developing countries.

In theory, globalization intends to provide more jobs for low-income workers in developing countries, and this work in return contributes to the national income of the

country, which in its turn finances health and social services, training and education, research, cultural services, and other national activities. However, developing countries face the challenge of dealing with the changing nature of work, such as the increasing fragmentation of the labour market, the demand for flexible contracts, increased job insecurity, a high work pace, long and irregular working hours, low control over job content and process, and low pay, together with new occupational hazards accompanying the old and new industries and technologies.

Modern working life also changes constantly due to rapid scientific and technological advances. Consequently, rapid changes in production systems take place. This means that workers have to deal with:

- increased demands of learning new skills
- the need to adopt new ways of working
- the pressure of the demand for higher productivity
- demands for increased quality of work
- increased time pressure and hectic jobs
- higher job competition
- increased job insecurity and less benefits
- less time for co-workers and socialising.

Some consequences of high job demands, low job control and low co-workers support are illustrated below.

**Box 1:**

**Risks for work-related stress and health: How bad can stress be?**

**Some research findings:**

High job demands may result in exhaustion (Houtman et al, 1998)	7 times higher risk	for emotional
Low co-worker support may result in shoulder problems (Ariens et al, 2001; Hoogendoorn et al, 2000)	2 times higher risk	for back, neck and
Low job control may result in mortality (Kivimäki et al, 2002)	2 times higher risk	for cardiovascular
High strain may result in morbidity (Belkic,et al 2004) (High demands - Low control) Karasek and Theorell, 1990	3 times higher risk	for hypertensive

These various global and local changes lead to increasing demands on a growing number of workers. When workers are unable to deal with these demands work-related stress may result. When stress persists or occurs repeatedly, it can have various negative effects on workers and the companies they work for.

- **Effects on workers;** work-related stress may lead to varying health problems affecting physiological and psychological health, as well as the worker's cognition and behaviours. One should not make the mistake of thinking about psychosocial and organisational hazards solely as risks to psychological health (Cox, 1993). Sickness absence due to mental health, musculoskeletal or cardiovascular problems may be the result, and eventually work disability or death will be the consequence.

- **Effects on their companies;** work-related stress may affect corporate performance due to costs associated with increased absenteeism and staff turnover, reduced performance and productivity, increased unsafe working practices and accident rates, increased complaints from clients/customers, replacement of absent workers, training of substitute workers, and so on.

Although we can now document an array of research on the magnitude of causes and consequences of work-related stress in developed and industrialised countries, work-related stress is still a problem which is far from being resolved. In turn, very little data is available from developing countries. However, it has been shown that in a 'country in transition' such as Russia, changes in the so-called 'traditional' hazards (chemical, biological and physical) result in increased work-related stress (Kuzmina et al, 2001). Exposure to organic solvents may have a psychological effect on the person through their direct effects on the brain, through the unpleasantness of their smell or through fear that such exposure might be harmful (Levi, 1981). Physical as well as psychosocial hazards can affect health through psycho-physiological, as well as psycho-chemical pathways (Levi, 1984).

As indicated previously, for developing countries, as well as for countries 'in transition', often no specific national data on work-related stress is available due to poor recording mechanisms and non-recognition of the related outcomes in most of these countries. The following crude and global data listed below (see Box 2) underline the importance and challenges ahead:

## **Box 2: Statistics**

### **On work and health in developing and industrialized countries.**

- About 75% of the world's labour force (which counts about 2400 million people) lives and works in developing countries.
- 20-50% of workers in industrialized countries may be subject to hazardous exposures at work and this rate is expected to be higher in the developing and newly industrialized countries.
- 50% of workers in industrialized countries judge their work to be “mentally demanding”.
- Each year there are about 120 million occupational accident injuries with 200,000 occupational fatalities and 68-157 million cases of occupational disease among the global work force.
- More than 80% of the workforce consists of small and medium-sized enterprises. In developing countries it is estimated to be even more and the largest workforce is to be found in the informal sector. Small and medium-sized enterprises, in particular, as well as the informal sector have poor access to occupational health and safety services and other external support. They often lack knowledge about occupational health in general.
- Poor occupational health and reduced working capacity of workers may cause economic loss up to 10-20% of the Gross National Product of a country. Globally occupational deaths, diseases, and illnesses account for an estimated loss of 4% of the gross domestic product.

Source: [http://www.who.int/occupational\\_health/en/oehstrategy.pdf](http://www.who.int/occupational_health/en/oehstrategy.pdf)

The majority of the developing countries have very poor investment in research and still have many unsolved problems; these are maybe the main causes that explain the paucity in generating proper data and evaluating the impact of the changes at work. However, some specific cross-sectional studies have been conducted; these show the importance of high blood pressure and cardiovascular disease in the population, in Mexico, Brazil and Colombia and the differential distribution between groups of workers exposed and not exposed to negative psychosocial conditions, such as job strain, over-commitment and job insecurity. Some studies also highlight the interest in the growing economic sectors, such as services and the informal economy (ICOH Conference of Cardiovascular diseases, 2005).

There is, however, data related to hypertension prevalence from most of Latin American countries. Hypertension, and other cardiovascular morbidity and mortality have a high prevalence among the adult population in most Latin American countries. These figures can only become associated to stressful working conditions through surveys and cohort studies in these countries. Although longitudinal studies are unavailable in developing countries thus far, a study including the Job Content Questionnaire in Hermosillo city, Mexico (Cedillo and Grijalva, 2005) reported the prevalence rate of High Strain Jobs (High job demands – Low control) across economic sectors to be 26%. Results from different studies in other countries showed that the risk for hypertension could be increased between 2 to 3 times because of high strain jobs. Using this data it was estimated that having high demands and low control in Latin America accounted for a range of 21% to 32% of the hypertension present in these countries (population attributable risk).

In industrialized countries, people are increasingly familiar with what work-related stress is and how to manage it, although the problem persists and even seems to be increasing in the European Union (Iavicoli, S. et al, 2004). However, in some developing countries, people may lack knowledge on this subject, and are not aware of the importance of dealing with work-related stress.

In Latin America, for example, work-related stress is at present already acknowledged as one of the big epidemics of modern working life. At the same time, many Occupational Health and Safety professionals from this region think that a good psychosocial environment and good ergonomics are related to “comfort” and are beyond the “risk control” phase of chemical, physical and biological exposures. Under this idea, the focus of regulation is still on setting up and reviewing permissible exposure values for noise and chemicals, establishing safety protections and controlling hazardous conditions associated with accidents. Unfortunately, at present, there is no interest in regulating or developing guides for good practices focussing on ergonomics and psychosocial hazardous exposures such as high speed work, long working hours, and job insecurity in Latin American countries. This means that most of the regulations to protect workers' health are the adoption of occupational exposure limits only for 'traditional' occupational health and safety risks, such as chemical substances, noise, vibration, radiation, heat and cold. Buildings and infrastructure conditions that could cause accidents are included in most of the countries' regulations.

## Chapter 3

### A DEFINITION OF WORK-RELATED STRESS

Work-related stress is a pattern of reactions that occurs when workers are presented with work demands not matched to their knowledge, skills or abilities and which challenge their ability to cope. When there is a perceived imbalance between demands and environmental or personal resources, reactions may include:

- physiological responses (for example increased heart rate, blood pressure, hyperventilation, as well as secretion of 'stress' hormones such as adrenaline and cortisol),
- emotional responses (for example feeling nervous or irritated)
- cognitive responses (for example, reduction or narrowing of attention and perception, forgetfulness), and
- behavioural reactions (for example aggressive, impulsive behaviour, making mistakes).

When in a state of stress, one often feels tense, concerned, less vigilant and less efficient in performing tasks. (See Chapter 4 for further detail)

Stress occurs in many different circumstances, but is particularly strong when a person's ability to control demands at work is threatened. Concerns about successful performance and fear of negative consequences resulting from performance failure evoke powerful negative emotions of anxiety, anger and irritation. The experience of stress is intensified if no support or help is available from colleagues or supervisors. Therefore, social isolation and lack of cooperation increase the risk of prolonged stress at work, as well as the related negative health outcomes and increased accident risk.

Conversely, work tasks with a high degree of personal control and skill variety, together with a work environment which includes supportive social relationships, can contribute

positively to workers' well-being and health. When demands exceed abilities and knowledge, and the individual or the supervisor are able to perceive this, then an opportunity may arise to change this into a state of balance and a challenging and motivating situation of learning and growth via discussions and actions taken by the employer and/or worker or the worker representative.

Importantly, as *“health is not merely the absence of disease but a positive state of physical, mental and social well-being”* (WHO, 1986), a healthy working environment is one in which there is not only the absence of harmful conditions but also the presence of health-promoting actions.



## Chapter 4

# A MODEL ON WORK-RELATED STRESS

The stress process can be summarized in a model, which illustrates the causes of stress, stress reactions, long-term consequences of stress and individual characteristics, as well as their interrelations.

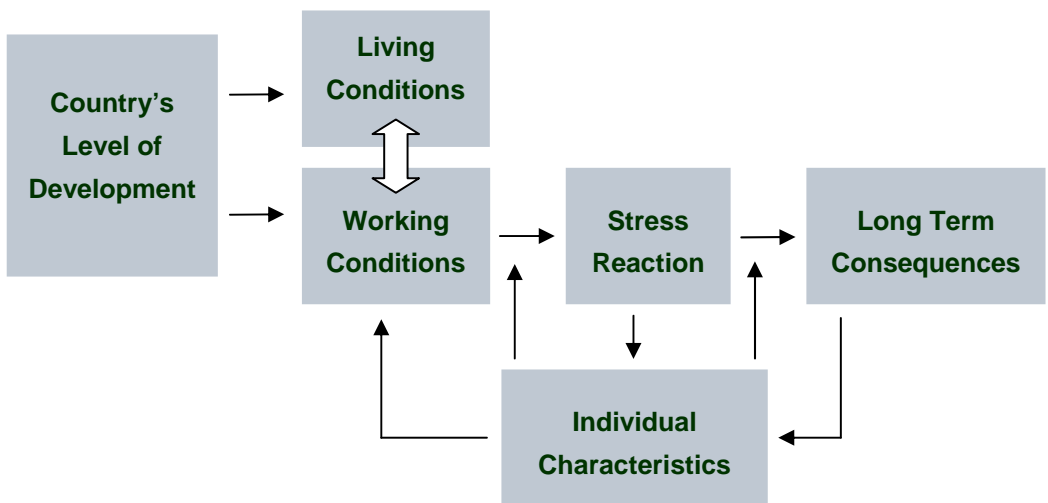


Figure 1: Contextualized model on causes and consequences of work-related stress

**Stress reactions** may result when people are exposed to risk factors at work. Reactions may be emotional, behavioural, cognitive, and/or physiological in nature. When stress reactions persist over a longer period of time, they may develop into more permanent, irreversible health outcomes, such as chronic fatigue, musculoskeletal problems or cardiovascular disease.

**Individual characteristics**, such as personality, values, goals, age, gender, level of education, and family situation influence an individual's ability to cope with demands imposed upon him or her. These characteristics may interact with risk factors at work and

either exacerbate or buffer their effects. Physical and psychological characteristics, such as physical fitness or a high level of optimism, can act as precursors or buffers in the development of stress reactions and mental health problems. On the one hand, if workers are able to deal with bad working conditions, they will be more experienced and self-confident to overcome similar conditions the next time they have to deal with them. On the other hand, when stress reactions like fatigue and long-term health problems occur, they will often reduce a person's ability to perform well and thus aggravate the experience of stress. This will ultimately result in exhaustion and breakdown or burnout.

## Working and living conditions

In real-life working situations workers have to deal and interact with family (and social) situations. Resources to adequately face family and social responsibilities and to ascertain a good quality of the worker's recovery time depend on the level of literacy, level of income and level of social infrastructure, given by the level of any country's development, as well as the understanding and provisions made by employers to deal with family matters. On the other hand, quality of work is also determined by the level of development of the given country. For example, it is common that developing countries look for foreign investments in order to improve their employment offer and developed countries tend to transfer obsolete industrial processes and often unsafe machinery to developing countries either as foreign investments or to sell those technologies to native investors who pay less for used than for new machines. Therefore, contextual factors at different levels are important determinants for the quality of work and living conditions.

The regional and/or national situation sets norms and values that will also pertain to work and to the situation at home and not only reflect cultural values, but include other issues like demographic developments and the economic situation reflected by the degree of employment, technological developments and legislative issues. Although the individual may influence the organization and the organization may influence the sectoral or national level, the 'higher' level will often be more powerful than the 'lower' level. The individual level is the lowest one in this hierarchy

## Causes of work-related stress

Although individual and organizational characteristics play a role in the development of work-related stress, the majority will agree that work-related stress results from the interaction between the worker and the conditions of work. Views differ, however, on the importance of **worker** characteristics versus **working conditions** as the primary cause of stress. These differences are important, since they suggest and lead to different ways to prevent the source of stress at work.

One view promotes that **individual differences** of the worker such as personality, age, education, experience and coping style are most important in predicting whether certain job specifications will result in stress. These individual differences demand complementary prevention strategies that focus on the individual and promote ways of coping with demanding working conditions.

However, the prevailing view based on evidence is that certain **working conditions** are stressful to most people. Stressful working conditions are related to psychosocial hazards, such as too high or too low job demands, a fast work pace or time pressure, a lack of control over work load and work processes, lack of social support from colleagues and/or supervisors, discrimination, isolation, psychological harassment, lack of participation in decision making, poor communication or information flow, job insecurity, lack of opportunity for growth, lack of advancement or promotion, irregular working hours (especially shift work), and being exposed to unpleasant or dangerous physical conditions, and not being able to control them. Here, prevention strategies focus on changing working conditions or job redesign.

Working conditions appear to be worse for workers employed in small enterprises, the self-employed, casual workers, and workers in the informal sector. The risks they face are generally of a chronic, long lasting nature, herewith implying negative health consequences. In addition, limited resources and heavy workload may aggravate exposure to stressful working conditions and adversely affect family lives.

Work-related stress may additionally result from a poor balance at the home-work interface, with particularly severe consequences when poverty, risk of unemployment and poor living conditions converge. This would particularly affect women in countries where gender disparities are strong and women have had a recent involvement in the

workforce. Responsibilities at work may conflict with family responsibilities such as care for a sick child or an elderly relative, or commitments to family and friends. Spill-over effects between work and home responsibilities showed to be one of the best predictors of psychological strain among women workers across hierarchical levels and sectors (Cedillo and Scarone, 2005).

These problems ask for prevention strategies which promote work-life balance and focus on the provision of support for people enabling them to combine work with family responsibilities with no detriment to other rights. Further indirect factors may influence the degree of work-related stress such as access to the general practitioner or occupational health physician, other relevant professionals, and also the economic situation in the country of residence, legislation and more informal regulations within the particular country or sector.

Women in workplaces generally experience and express stress-related problems more than men (for example, Kauppinen et al, 2003, Giuffrida et al, 2001). Causes for work-related stress that are rather frequent and specific for women in both industrialised as well as developing countries are :

1. the double role they have to play both at home and work, and the difficulty in balancing these roles,
2. the gender roles of society and the need for an independent role against the need to conform to social expectations,
3. the sexual harassment at work, which is mainly directed at women at work, and
4. gender based discrimination reflected in lower wages and higher job requirements.

Besides these adverse aspects at work, women are frequently exposed to domestic violence. The prevalence of domestic violence in Latin American countries has an average of 30% (Pallito, 2002) and although work performance is affected and could seem like a home → work conflict, there are examples of work policies which place domestic violence as a work-related problem and develop some interventions at the organizational level (U.S. Department of Labor, 1996; OPS, 2003).

According to the World Health Organization in a report on violence and health (Krug, 2002) the percentage of women who had been assaulted by a partner in the previous twelve months varied from 3% or less among women in Australia, Canada and the United States to 27% of ever-partnered women (that is, women who have never had an ongoing sexual partnership) in Leon, Nicaragua, 38% of currently married women in the Republic of Korea, and 52% of currently married Palestinian women in the West Bank and Gaza Strip. For many of these women, physical assault was not an isolated event but part of a continuing pattern of abusive behaviour. Research suggests that in Monterrey, Mexico, 52% of physically assaulted women had also been sexually abused by their partners. Besides these data, the World Health Report describes also how poor women and girls may be more at risk of rape in the course of their daily tasks than those who are better off, for example when they walk home on their own from work late at night, or work in the fields or collect firewood on their own.

Research states that "the human cost in grief and pain, of course, cannot be calculated. In fact, much of it is almost invisible. While satellite technology has made certain types of violence – terrorism, wars, riots and civil unrest – visible to television audiences on a daily basis, much more violence occurs out of sight in homes, workplaces and even in the medical and social institutions set up to care for people. Many of the victims are too young, weak or ill to protect themselves. Others are forced by social conventions or pressures to keep silent about their experiences." (Krug, 2002; WHO, 2003)

The World Health Report on Violence and Health further states that "between 1996 and 1997, the Inter-American Development Bank sponsored studies on the magnitude and economic impact of violence in six Latin American countries (Buvinic and Morrison, 1999). Each study examined expenditures, as a result of violence, for health care services, law enforcement and judicial services, as well as intangible losses and losses from the transfer of assets. Expressed as a percentage of the gross domestic product (GDP) in 1997, the cost of health care expenditures arising from violence was 1.9% of the GDP in Brazil, 5.0% in Colombia, 4.3% in El Salvador, 1.3% in Mexico, 1.5% in Peru and 0.3% in Venezuela"(Krug, 2002).



### **Box 3: Causes of work-related stress: A Summary**

#### **Work**

- High work pace, time pressure
- Lack of control (work pace, but also related to physical risks)
- Low participation
- Little support from colleagues and supervisor
- Poor career developments
- Job insecurity
- Long working hours
- Low income
- Sexual and/or psychological harassment

#### **Work-home interface**

- Conflict of responsibilities and roles, particularly for women
- Home is the workplace
- Family exposed to work-related hazards
- Domestic violence, physical assault, rape
- Difficulties in daily life logistics

#### **Person**

- Competitive, hostile
- Overcommitted
- Lack of self confidence

## Consequences of work-related stress

**Consequences for the worker:** when workers experience work-related stress this may lead to a variety of physiological, emotional, cognitive, and behavioural reactions.

### **Box 4:**

#### **PHYSIOLOGICAL reactions to stress:**

- increasing heart rate
- increasing blood pressure
- increasing muscle tension
- sweating
- increased adrenaline production and secretion, and
- superficial breathing at higher frequencies.

#### **EMOTIONAL reactions may include:**

- fear
- irritation
- depressive mood
- anxiety
- anger, and
- diminished motivation.

#### **COGNITIVE reactions may include:**

- decreased attention
- narrowing of perception
- forgetfulness
- less effective thinking
- less problem solving, and
- reduced learning ability.

#### **BEHAVIOURAL reactions may include:**

- decreasing productivity
- increasing smoking
- increasing drug use and/or alcohol consumption
- making errors, and
- reporting sick

When exposure to stress does not decrease and continues over prolonged periods, workers do not have enough time to recover. Stress may eventually cause mental and physical disorders and impair the immune system, resulting in sickness and absence from work and work disability.

**There are some long-term risks of reduced health and disease for the worker, which may be expressed in :**

- high blood pressure
- angina complaints
- burnout and affective disorders
- depression<sup>1</sup>
- disturbed metabolism (risk of Type II diabetes)
- alcohol dependence, and
- musculoskeletal disorders

**Box 5: Clearly the employers and their companies will in turn experience negative consequences:**

**Persistent stressful working conditions are associated with:**

- increasing absenteeism
- increasing tardiness
- increasing personnel turnover
- decreasing performance and productivity
- decreasing growth rates and profit
- decreasing quality of work and products
- increasing unsafe working practices and accident rates
- increasing complaints from clients/customers
- increasing violent events
- increasing occupational diseases, and increasing costs through all of the above.

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<sup>1</sup> Depression has been linked to occupational stress (Tenant, 2001; Roos & Sluiter, 2004), and 8% of depression has been attributed globally to the environmental factors, in particular occupational stress (Prüss-Üstün, Corvalan, 2006)

## Chapter 5

# MANAGING WORK-RELATED STRESS: A STEP-WISE APPROACH

Although it is not possible to give one specific prescription for preventing work-related stress, it is possible to offer guidelines for the prevention of stress in organisations.

As the basic foundation of a healthily challenged workforce, workers have to be motivated, feel safe in their job, be satisfied, and perceive to have control over their work. Prevention of work-related stress is, therefore, an important undertaking and we propose that it involves a stepwise process (see also WHO, 2004)<sup>2</sup> :

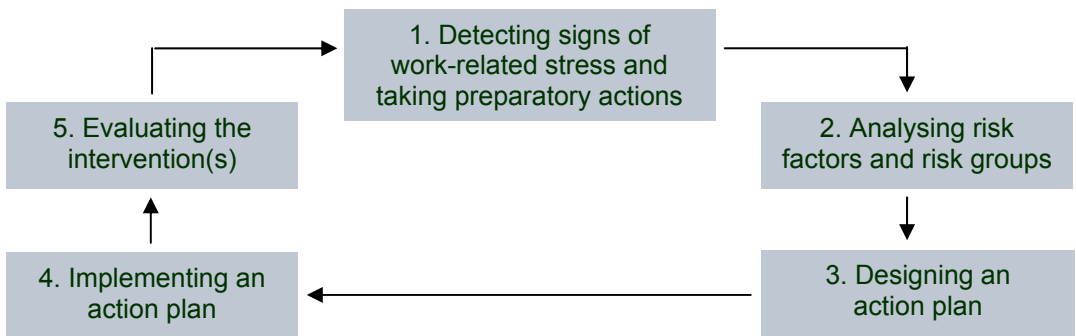


Figure 2: Process of Stress Prevention

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<sup>2</sup> For more information on this subject we refer to the booklet 'Work Organization and Stress'. This booklet is written by Stavroula Leka, Amanda Griffiths, Tom Cox, Institute of Work, Health and Organizations, Nottingham, United Kingdom, a WHO Collaborating Centre in Occupational Health, and is published by the World Health Organization in the Protecting Workers' Health series (No. 3) ([www.who.int/occupational\\_health/publications/stress/en/](http://www.who.int/occupational_health/publications/stress/en/))

## Step 1: Preparatory actions and detecting signs of work-related stress

The first step in the stress management process is a preparatory phase in which the following actions are taken:

- Secure management commitment and company-wide support to address work-related stress at the organizational and workplace level. This is absolutely necessary if results should be successful.
- Raise awareness of work-related stress - it is important that workers as well as employers understand exactly what work-related stress is (causes, consequences, costs, solutions). This could be done via awareness-raising campaigns providing written and verbal information.
- Since family and community support is important, particularly in developing countries, they should also be included in the work-related stress management process, particularly addressing the work-home interface.
- Gather evidence of signs of work-related stress in the company. The use of the same or standardized approaches will allow comparison between different task groups of workers.
- Involve the members of the Joint Commission of Occupational Safety and Health wherever it exists. These commissions are required by law in most of the Latin American countries and are included in the ILO Convention 155 which some Latin American countries signed. Although these commissions are not as empowered and trained as it would be desirable, most of them are aware of national health and safety regulations. However, they do not know anything or very little about adverse psychosocial factors at work. It would be helpful to make information available to these groups in order that workers and their representatives become aware of these risk factors.
- Worker input and involvement is essential in all phases of the stress management process. Only the worker knows his/her job best.
- Set goals with time limits in terms of one or more items listed in previous Box 5.

## Step 2: Analysing risk factors and risk groups

In this phase a more detailed analysis of the situation takes place. New information enables insight into working conditions and individual characteristics of workers, thus sources of work-related stress and workers at risk can be identified. There are several methods that can be used to collect this information (for example using questionnaires, checklists, interviews, analysis of absence figures). A questionnaire such as the example in Box 6 can be used to gain insight into working conditions that may cause work-related stress. It may be completed with additional questions that are specific to the work, the workplace or the surrounding conditions.

<b>Box 6: Questionnaire for Workers Addressing causes of work-related stress</b>		
<b>Job demands and working conditions:</b>		
Do you have enough time to get your job done properly?	<input type="checkbox"/> Yes, regularly	<input type="checkbox"/> No or sometimes
Are you exposed to unfavourable physical conditions in your work (for example unfavourable climate, noise, radiation, chemicals, sharp or moving objects, slippery surfaces, constant repetitive work, heavy lifting or strenuous work)?	<input type="checkbox"/> Yes, regularly	<input type="checkbox"/> No or sometimes
<b>Participation and control:</b>		
Can you choose your own work methods, pace, and/or order?	<input type="checkbox"/> Yes, regularly	<input type="checkbox"/> No or sometimes
Can you decide yourself when to take a break?	<input type="checkbox"/> Yes, regularly	<input type="checkbox"/> No or sometimes
Are you involved in decision making?	<input type="checkbox"/> Yes, regularly	<input type="checkbox"/> No or sometimes
Are there regular meetings to discuss work?	<input type="checkbox"/> Yes, regularly	<input type="checkbox"/> No or sometimes
Can you improve any unfavourable physical loads in your work?	<input type="checkbox"/> Yes, regularly	<input type="checkbox"/> No or sometimes
<b>Interpersonal relationships:</b>		
Do you receive support from your supervisor and/or colleagues?	<input type="checkbox"/> Yes, regularly	<input type="checkbox"/> No or sometimes
Are you isolated from others during work?	<input type="checkbox"/> Yes, regularly	<input type="checkbox"/> No or sometimes
Are you treated differently, for example, because of your race, gender, ethnic origin or disability?	<input type="checkbox"/> Yes, regularly	<input type="checkbox"/> No or sometimes
Do you experience violence from customers, clients, patients or members of the public?	<input type="checkbox"/> Yes, regularly	<input type="checkbox"/> No or sometimes

<b>Career development and job security:</b>		
Do you have good career prospects?	<input type="checkbox"/> Yes, regularly	<input type="checkbox"/> No or sometimes
Are you able to develop your skills and intellect in your job?	<input type="checkbox"/> Yes, regularly	<input type="checkbox"/> No or sometimes
Is your job security good?	<input type="checkbox"/> Yes, regularly	<input type="checkbox"/> No or sometimes
Is it likely that during the next couple of years you will be in the present job with your current employer?	<input type="checkbox"/> Yes, regularly	<input type="checkbox"/> No or sometimes
<b>Working hours:</b>		
Do you work long hours?	<input type="checkbox"/> Yes, regularly	<input type="checkbox"/> No or sometimes
Do you work evenings, nights, and/or weekends (shift work)?	<input type="checkbox"/> Yes, regularly	<input type="checkbox"/> No or sometimes
Do you have irregular working hours?	<input type="checkbox"/> Yes, regularly	<input type="checkbox"/> No or sometimes
<b>Role in the company and information:</b>		
In general, are your work tasks clear to you?	<input type="checkbox"/> Yes, regularly	<input type="checkbox"/> No or sometimes
Do you have conflicting tasks/roles?	<input type="checkbox"/> Yes, regularly	<input type="checkbox"/> No or sometimes
Do you receive enough information to do your work properly?	<input type="checkbox"/> Yes, regularly	<input type="checkbox"/> No or sometimes
Do you receive feedback on your performance?	<input type="checkbox"/> Yes, regularly	<input type="checkbox"/> No or sometimes
<b>Income:</b>		
Is your income sufficient to support yourself and your family?	<input type="checkbox"/> Yes, regularly	<input type="checkbox"/> No or sometimes
Work-home interface: Does your work interfere with your family responsibilities or leisure time activities?	<input type="checkbox"/> Yes, regularly	<input type="checkbox"/> No or sometimes
Is your home also your workplace?	<input type="checkbox"/> Yes, regularly	<input type="checkbox"/> No or sometimes
<b>If yes:</b>		
Are your family members protected against unfavourable physical working conditions (see question 2)?	<input type="checkbox"/> Yes, regularly	<input type="checkbox"/> No or sometimes
Do you consider your home as a proper place for you to work?	<input type="checkbox"/> Yes, regularly	<input type="checkbox"/> No or sometimes

When sources of work-related stress and workers at risk have been identified, the goals set in Step 1 may be further specified.

### Step 3: Designing an action plan

- a) Decide which actions for solutions should be taken to reduce work-related stress by establishing an inventory of possible solutions to the causes of work-related stress as identified in step 2. For this action refer to the examples in Box 7 of actions to prevent work-related stress below.
- b) This should be followed by a plan prioritizing the various actions needed, identifying who will be responsible for which action, decide on time limits (for example 3-6 months), and update your goal as identified in Step 1.



#### Box 7: Examples of actions to prevent work-related stress

Problems:	Possible actions:
<b>High workload</b>	<ul style="list-style-type: none"><li>• Redistribution of work among colleagues</li><li>• Prioritize work/tasks</li><li>• Offer a training course (e.g. on stress or time management)</li></ul>
<b>Monotonous and routine work</b>	<ul style="list-style-type: none"><li>• Make sure that where possible workers have some control over work pace</li><li>• Make sure there are enough breaks</li><li>• Job rotation (moving to a number of different tasks usually according to a rotation plan)</li><li>• Job enlargement (add more tasks of same difficulty)</li><li>• Job enrichment (add more difficult tasks)</li><li>• Where necessary, offer additional training or education</li></ul>

<b>Physical risks at the work place</b>	<ul style="list-style-type: none"> <li>• Replace the risk producing machines or devices by others that produce less risk</li> <li>• Shield the source of risk (noise or other)</li> <li>• Inform workers about the negative effects of exposure to these risks</li> <li>• Offer workers personal protection devices (ear plugs, hand cuffs to protect them from hot surfaces etc.)</li> </ul>
<b>Conflicting or unclear tasks or roles</b>	<ul style="list-style-type: none"> <li>• Make a clear job description with clear and appropriate demands</li> </ul>
<b>Insufficient work experience for the job</b>	<ul style="list-style-type: none"> <li>• Provide suitable training where necessary</li> <li>• Appoint a personal mentor at work</li> <li>• Offer help and encourage help from colleagues</li> <li>• Leave more difficult tasks to other more experienced colleagues</li> </ul>
<b>Lack of social support from manager and/or colleagues</b>	<ul style="list-style-type: none"> <li>• Offer managers training to learn how to treat their workers</li> <li>• Arrange regular team building activities (dinner after work, team excursions, or other social activities)</li> <li>• Have lunch and coffee breaks together</li> <li>• Stimulate and reward team work</li> <li>• Arrange regular meetings in which work problems can be discussed and solved (together)</li> </ul>
<b>Work-home interface</b>	<ul style="list-style-type: none"> <li>• Support or provide child care facilities</li> <li>• Flexible working times, such as temporary and/or part-time work</li> <li>• Teleworking/working from home</li> <li>• Address the needs of the family, children in addition to care for the worker</li> <li>• Provide worker transportation when needed</li> </ul>

Actions and solutions should primarily focus on changes in the organizational culture and the **organisation of work**, such as:

- redistributing work among colleagues,
- introducing job rotation (moving to a number of different tasks usually according to a rotation plan),
- introducing job enlargement (adding more tasks of the same difficulty),
- introducing job enrichment (adding more difficult tasks),
- improving managerial ability (for example by management skills training)

- ergonomic improvements in the work place<sup>3</sup>
- improving working schedules and working and resting times (for example, forward rotation of shifts in time is preferred from a health perspective as compared to backwards rotation of shifts),
- implementing direct worker consultation at work,
- improving communication between groups of workers, or between the client and the worker(s), and between workers and supervisors,
- providing clear job descriptions or tasks, and
- providing clear job promotion rules and paths.

Note : The advantage of this approach is that it deals directly with the causes of stress in the work environment, and may have a positive effect on the total workforce of a company.

Actions for solutions in preventing or decreasing work-related stress may include improving **workers' individual** abilities, skills and coping capacity through training and education, such as courses in:

- time management,
- dealing with aggressive customers,
- lifting heavy goods,
- using appropriate machines or equipment,
- stress management, and assertiveness training,
- seeking support from family, community, and religion and spirituality.

Note: This individual-focused approach has two disadvantages when there are major problems in the work place:

1. The beneficial effects on stress symptoms are often short lived;
2. Important causes of stress in the work environment are ignored and will continue to cause work stress.

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<sup>3</sup> For more information on this subject we refer to the booklet 'Preventing Musculoskeletal Disorders in the workplace'. This booklet is written by Alwin Luttman, Matthias Jäger and Barbara Griefahn of the Institute of Occupational Physiology at the University of Dortmund, a WHO Collaborating Centre in Occupational Health, and is published by the World Health Organization in the Protecting Workers' Health series (No. 5) ([www.who.int/occupational\\_health/publications/muscdisorders/](http://www.who.int/occupational_health/publications/muscdisorders/))

As a general rule, organisational strategies to prevent work-related stress should be given top priority. However, even the most conscientious efforts to improve working conditions are unlikely to eliminate stress completely for all workers. For this reason, a combination of the organisational and individual approach is often the most useful way to prevent work-related stress while staying focused on organizational and work-organizational measures. If they are available, the occupational health service, professional psychologists or professionals with a related expertise, can advise the employer about prevention measures or interventions which are best indicated for the identified risk situations.

#### Step 4: Implementing a plan for action

Before starting the implementation phase, it is important to discuss how the action plan might be implemented and how different partners in the organisation as well as their workers, or people outside the organization will be involved.

It is essential to inform workers and involve them in the changes that will take place. They need to know who should be involved in the process of change. Participation of workers is crucial as they best understand their work and often have ideas on how to improve it. Only through participation will any existing resistance to change in organisations be reduced. Sometimes others outside of the organisation can facilitate the change process.

## **Box 7: Case Study:**

### **An example of successful implementation of solutions to reduce work-related stress in organizations in two Vietnamese cities**

(example from WHO/WPRO, 1999)

**With the help of the WHO**, a Healthy Workplace Programme was initiated in Vietnam in 1998-1999. The programme was introduced through the Healthy Cities initiative, and targeted small and medium-sized organisations in two Vietnamese cities.

As a first step a local organizing committee was established. Many agencies at the district level, including the Department of Health, Department of Social Affairs, Commercial and Industry Office, trade unions, and women's group participated. By way of orientation, the project steering group participated in a three-day workshop on healthy workplaces, and two training courses were conducted for agency representatives and workplace personnel to prepare them for project management. One course was offered for multidisciplinary managers at district level to introduce them to occupational safety and health regulations and health risk assessment in the workplace. A second one was provided for worker representatives and owners on the principle of improving working conditions.

Subsequently, a survey was conducted to assess workers' needs in terms of health protection and promotion. This survey uncovered a variety of health and safety complaints and a limited number of existing health interventions.

Based on the survey results, a comprehensive healthy work action plan was developed and implemented in the participating organisations, including modifications to working conditions, health examinations, and healthy life style activities. To encourage high achievement among participating workplaces, a competitive award system was established based on 100 realistic criteria.

Although the managers of small businesses were initially negative about the programme, they became supportive after observing the benefits. The programme resulted in a change in workplace culture within participating organisations, including a more relaxed working environment. The workers also benefited from improvements in the physical working environment and the health information received on a variety of topics. A cost-benefit analysis revealed financial gains from increased productivity relative to any health and safety investment made by the management.

### **Box 8: Case Study:**

#### **Train the trainer program in Mexico**

**A three-year collaboration** between the ILO (Work Safe Program) and the CTM, one of the major unions in Mexico initiated a 'train the trainer' program. A chapter on work-related stress was included, which was replicated by some of the unions, who made their own slides and brochures from this material. This material will be used to raise workers' awareness about this subject.

### **Step 5: Evaluating the intervention(s) made**

Evaluation is an essential step in the work-stress prevention program and determines whether the implementation process has been successful in producing the desired effects.

The following questions should lead this process:

a) Have the goals been reached?

Aim to re-assess and re-analyse situations where work-related stress is persistent. Assess how far goals previously set have been reached (step 1 and 2), for example, a reduction in health problems or in the rate of absenteeism.

b) Does the action plan have unexpected effects?

It is possible that the action plan has some other unexpected effects, such as, when trying to decrease the workload of a specific work group, this may lead to an increased workload for other work groups.

c) What are the financial costs and benefits of the action plan?

Solutions to reduce work-related stress may entail specific costs. However, such measures will benefit the worker and the company in the long term (see Box 5). Therefore, it is very useful to carefully evaluate the short-term costs and long-term benefits of the measures introduced.

- d) Are the people involved satisfied with their new arrangements or ways of working?  
Ask workers directly or circulate a questionnaire to analyse the new situation and compare the new figures and results with those obtained before (refer to questionnaire in Box 6, pages 29-30 ).

Using the evaluation, it can be determined whether solutions need to be changed and further action be taken to manage work-related stress. This might lead to a revised action plan.

It is advisable to conduct the evaluation in two phases:

1. An evaluation can be made shortly after the action plan is implemented (after about three months) to determine whether the implementation process has been successful and whether there are any short-term effects of the program.
2. After a longer period (about 1 or 2 years) to determine if the planned goals have been reached, costs reduced and organisational benefits increased through the implementation of the program.

Attention: The prevention of work-related stress does not end with evaluation. Rather, stress prevention should be seen as a continuous process that uses evaluation data to refine or redirect the intervention strategy.

## **Box 9: Case Study:**

### **Cost-effective work-related stress management in the police force**

**In the Netherlands**, the Ministry of Social Affairs and Employment has actively encouraged and subsidised a sectoral approach to risk-management, among others, on work-related stress. One of the reasons is the high costs of long term absence and disability due to work-related stress in the Netherlands. These costs are estimated to be four billion Euros a year... i.e. about 1,5 % of the GDP.

The overall aim has been to achieve a reduction in exposure to sector-specific psychosocial risks of about 10% over a period of approximately three years, which would eventually lead to a reduction in absence and disability inflow due to work-related stress.

These sectoral risk management projects were called Safety and Health Covenants. The covenant can be described as a 'gentleman's agreement' between employer and employee representatives of a sector, who - in the presence and with the advice of the Ministry - agree on which risks to tackle, the approach or measures to be taken, and which specific goals are to be formulated at sectoral level.

English summary available: [www.eurofound.eu.int/ewco/2005/12/NL0512NU01.htm](http://www.eurofound.eu.int/ewco/2005/12/NL0512NU01.htm)

In the police sector psychosocial risks appeared to have decreased by 10% or more over a 4-year period. Courses to handle aggression and violence were perceived as most effective measures, although the way these courses were handled, as well as their perceived effectiveness differed per department. The approach of the covenant was different for different departments, but both organisational and individual approaches were included. During this covenant period, absence decreased by more than 3%. This alone already resulted in a benefit of 40 million Euros. The benefits by far exceeded the costs made to develop and implement the projects which were only some 3 million Euros.

Although this case is not a case from a developing country, it shows the benefit of working together as a group of organizations that have a similar psychosocial risk profile, and who appear to have been successful in managing the risks through cost-effective interventions.

## Chapter 6

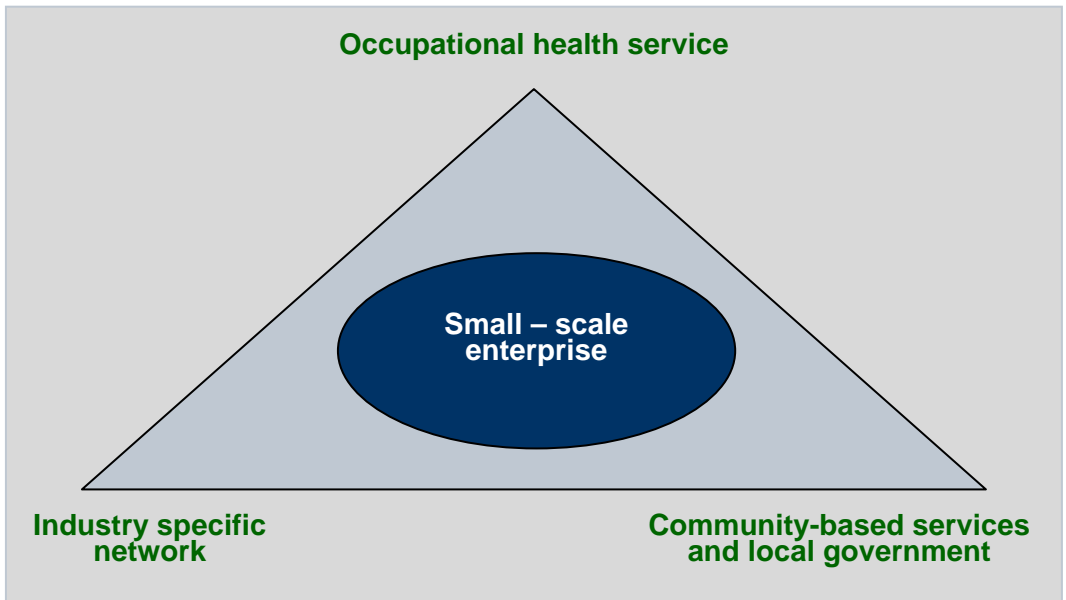
# THINK GLOBALLY – ACT LOCALLY

Although most of the solutions presented focus mainly on large organisations and on formal working relationships, most of these measures can also be adopted in small- and medium-sized enterprises. Globalization is increasing the number of small- and medium-sized organisations, many of which serve as providers for outsourcing to those large organizations. In addition, there are considerable numbers of informal workers in developing countries. However, these are very hard to reach and represent a real challenge to international Occupational Health and Safety experts.

The principle that guides the development of healthy workplaces in general, including work-related stress management, must *“be comprehensive, participatory and empowering and should encourage multisectoral and multidisciplinary cooperation, promote social justice and be sustainable”* (WHO, 1999). In developing countries, emphasis should be on the less powerful worker, as well as on small- and medium-sized organisations and the informal sector. 'Networking' and 'supportive local governments' are key aspects in the development of healthy workplaces in developing countries (WHO-ILO Meeting Report, 2000). The aim is to promote socially responsible local and international companies that extend their Occupational Health and Safety programs to their providers or require them to have similar ones.

Countries are encouraged to establish national and regional networks of healthy workplaces to facilitate the sharing of best management practices such as knowledge to effectively organize a structural reduction of work-related stress, as well as reduce other health risks often known to be present in the workplace and provide mutual support resulting in healthier workplaces with motivated workers. These networks can include the various facilitators of healthy workplace initiatives, such as industry managers from the public and private sectors, trade union representatives, government officials, health

service personnel, as well as fitness experts and nutritionists. Figure 3 below depicts the structure of a support network for small- and medium-sized enterprises.



*Figure 3 Support network for small and medium-sized enterprises (WHO, 1999)*

Networking provides a number of potential benefits, which include:

- sharing of information resources, expertise and experience;
- support for national and provincial efforts to reduce work-related stress;
- reinforcement of the healthy workplace concept; an ongoing mechanism for monitoring progress towards workplaces with managed stress, and a healthy, motivated workforce that is able to 'grow' and develop in the workplace.

## Chapter 7

# THE ROLE OF AN EMPLOYER AND/OR WORKER REPRESENTATIVE

According to the WHO, “*all workers have the right to healthy and safe work and to a work environment that enables them to live a socially and economically productive life*” (WHO, 1994). National law may include the obligation for employers to take measures to protect workers' health and safety. However, making sure that sufficient measures are taken to protect the health and safety of workers will prove to be beneficial to the workers as well as to the company. Continuity of protective measures and a healthy workforce ensure that production goes on, investments pay, and recognition that the human resource is an important investment for the company. It is in the interest of workers and their representatives to earn a living, and also to reach old age in healthy conditions. These interests are not contradictory but complimentary to company interests. An example of a cost-effective sectoral intervention is described in Box 10, below, and the five steps to prevent work-related stress outlined in this booklet describe the practical application of this process.

Therefore, employers and worker representatives must be aware and be able to prevent, or at least recognise signs of work-related stress in workers. Employers and workers are best equipped to manage work-related stress by changing its structural causes in the company or network. The role of the workers and their representatives should be to warn the company management when, or ideally before, work-related stress becomes a problem.

### Box 10: Top 10 factors for success in preventive action:

- **acknowledge** a health or work-related problem
- **treat** work stress like any other problem
- **act** on the problem
- **involve** workers in the intervention as they know best
- **acknowledge** workers as 'experts'
- **understand** that management has to act on changes in the organisational structure
- **use** a stepwise approach
- **use** a clear structure of tasks and responsibilities, and a schedule
- **use** different types of solutions, for both short term and longer term success
- **after care:** ensure the organisation and its workers are taken care of during the process, as well as after the first round....

amended after Kompier et al, 1998



## Chapter 8

### CONCLUDING REMARKS

Work-related stress is a matter of growing concern in developing countries as it will inevitably have future negative consequences for the health, safety and well-being of workers and the productivity and cost-effectiveness of the companies they work for. Increasing globalization and transfer of unhealthy work practices and unsafe technology make this easily become a great challenge and requires dedicated employers and worker representatives whose aim it is to protect the workforce. The box above outlines some success factors for such efforts.

Hypertension and cardiovascular diseases are one of the main chronic diseases in developing countries consuming an important proportion of their public health budget. High strain jobs could be contributing from 21 to 32% of hypertension prevalence. This means that job redesign would be a cost-effective measure to prevent a considerable proportion of this disease in addition to all the efforts taken to control the traditional risk factors (chemical, biological, and physical including health promotion aspects addressing for example overweight and nutrition).

Continuous education and training programs directed to Occupational Health and Safety professionals, policy makers, employers, managers, workers and their representatives, should adopt a comprehensive framework including psychosocial risk factors besides the most traditional hazards to initiate a number of integrated actions to improve working conditions and prevent work-related stress, supported by a framework of networking amongst other organisations and regional agencies. As organisations and workplaces constantly change to keep up with the developments of globalization, the causes of work-related stress may change as well. Therefore, there is a need to continuously and consistently monitor the organisation and the workplace for causes of work-related stress alongside other health risks. Surveys and other data gathering actions as proposed in this booklet are needed to accomplish this task. Particular consideration needs to be given to the

prevailing contextual circumstances, which characterize the nature of work and daily life in developing countries.

If employers, workers, their representatives and regional agencies do all they can to minimise work-related stress and work together towards an improved 'quality of working life', this will not only ensure a healthy and productive workforce, but it will also ensure sustainable economic benefits for the company and the nation as a whole. It is very important for employers and worker representatives to promote research and data gathering through national and regional surveys. This will provide actual data on occupational exposure prevalence to work-related stress, which will have the potential to feed cost-benefit studies, and which in turn support actions at the company and even at the national level.

**The WHO would like to invite practitioners and researchers from developing countries in psychosocial issues at work, and work-related stress in particular, to provide comments, suggestions for improvement, as well as further information on this phenomenon in developing countries.**

**Please contact [ochmail@who.int](mailto:ochmail@who.int), attention: Evelyn Kortum.**

## Chapter 9

### FURTHER INFORMATION

We trust this booklet will help to raise awareness on work-related stress. Further information on this subject is available at the following addresses and/or websites:

World Health Organisation (WHO)  
Interventions for Healthy Environments  
Department of Public Health and  
Environment  
Avenue Appia 20  
CH-1211 Geneva  
Switzerland  
Tel: +41 22 791 35 31  
ochmail@who.int  
Website: [www.who.int/occupational\\_health](http://www.who.int/occupational_health)

International Labour Office (ILO)  
4, route des Morillons  
CH-1211 Geneva 22  
Switzerland  
Tel: +44 22 799 61 11  
Website: [www.ilo.org](http://www.ilo.org)

Health and Safety Executive  
(HSE)  
Room 518, Daniel House, Trinity Road  
Bootle, Merseyside L207HE  
United Kingdom  
Tel.+ 151 951 3864  
Website: [www.hse.gov.uk](http://www.hse.gov.uk)

National Institute for  
Occupational Safety and Health  
(NIOSH)  
4676 Columbia Parkway  
Cincinnati, OH 45226-1998  
Tel: +1-0800-533-6847  
Website: [www.cdc.gov/niosh/homepage.html](http://www.cdc.gov/niosh/homepage.html)

European Foundation  
for the Improvement of Living and  
Working Conditions (EFILWC)  
Wyattville Road, Loughlinstown, Co Dublin,  
Ireland  
Tel: +353 1 2043100  
Fax: +353 1 2826456/2824209  
Website:  
[www.eurofound.ie/themes/health/index.html](http://www.eurofound.ie/themes/health/index.html)

The European Agency for Safety  
and Health at Work  
Gran Via 33  
E-48009 Bilbao, Spain  
Tel: + 34 944-794-360  
Fax: + 34 944-794-383  
Website: <http://agency.osha.eu.int>

## Chapter 10

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