

# The role of Human Resource Management in preventing Occupational Stress in Air Traffic Controllers in the European Union

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**Abstract:** The aim of this study research is to examine the role of human resource management in reducing and preventing job stress of air traffic controllers in the European Union. Secondary resources were used to answer this question. Through the international bibliography it was found that human resource management can implement methods and practices that will allow the effective prevention and management of occupational stress of the employees.

Air traffic controllers have been found to have increased levels of job stress due to their working conditions, such as important, accurate and on-time decision making process and their responsibilities. Occupational stress can result in numerous problems, such as decreased employee performance and burnout. This is even more important in this group of employees, since air traffic controllers are responsible for public safety. It is supported that human resource management can help in the decrease and prevention of occupational stress and burnout of employees.

More specifically, as it was found through the examination and study of relevant international bibliography, the following HR practices can lead towards the prevention and reduction of occupational stress: lowering the work load, creating a positive and stable organizational culture, abate the role conflict, pay adequate salary and rewards according to employees' skills and effort, respecting the guidelines that refer to occupational health and safety, provide training and education to employees so as to increase their knowledge and skills that leads toward increased job satisfaction and productivity, implementing an adequate and proper employee performance appraisal method, and providing counseling to employees in order to reduce burnout and improve their job performance and job satisfaction.

**Keywords:** occupational stress, employee performance, human resource management, burnout, air traffic controllers.

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## 1. INTRODUCTION

### 1.1 Aim of the research and research questions

The aim of this research is to examine the role of human resource management in reducing and preventing job stress of air traffic controllers in the European Union. More precisely, the research questions that this study will try to answer are the following:

- 1) To examine the nature/ levels of occupational stress in Air Traffic Controllers in E.U.
- 2) To study and examine the impact of occupational stress on the actual job performance.
- 3) To identify the most suitable ways in which Human Resources Management can prevent occupational stress in Air Traffic Controllers in EU

### 1.2 Significance of the study and expected outcomes

Anxiety is associated with reduced productivity at work, reduced profitability for companies, increased absenteeism of employees, increased the number of early retirements, depression, and many physical and psychological problems. Due to the significance of the job of air traffic controllers and their increased levels of job stress, it is of great importance to examine how can human resource management practices contribute to the prevention, reduction and effective management of occupational stress in this group of employees.

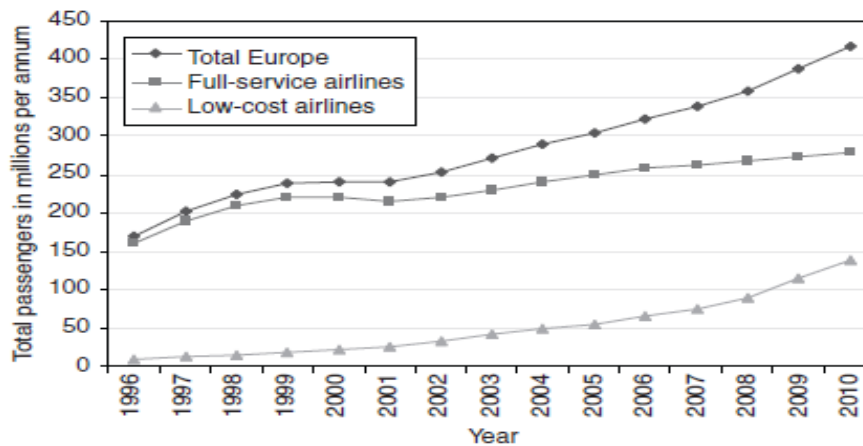
### 1.3 Theoretical background

During the decades of 1980s and 1990s a significant change in the structure of the workforce in industrialized economies occurred. Employees are often called to face greater demands in the workplace environment, less job security, changes to working hours and in general changes in the employee relations and working conditions. More precisely, the flexibility and the liberalization of the labour market has resulted in fundamental changes in the labour market, such as the introduction of new work forms (e.g. temporary work, part-time employment, non-pay employment, working without insurance), and wages cutting. Due to the above mentioned changes, employment relation systems in many countries and especially in Europe, had to face severe challenges and more precisely: immigration and brain drain (Fernandez, 2010; Bhargava et al., 2011; Okeke, 2013; Ifanti et al., 2014), deterioration of the employee's well-being due to insecurity from work and increase of leisure time due to unemployment, as well as violation of the psychological contract (Sheikh and Ahmad, 2012). One of the major consequences of the increased job demands and the changes occurred in the employee systems of many countries is the increase of job stress (Kuo et al., 2012; Rosales et al., 2013). Stress "is a general term which refers to two distinct concepts, namely 'stressors' (environmental characteristics, or thoughts which cause an adverse reaction in the individual) and 'strain' (the individual's adverse reaction to the stressor)".

Stress, or otherwise anxiety, is a stressful stimulus causing psychological tension. According to Pappas (2006), stress can be defined as a physical and psychological reaction to psychological pressing factors. From this point of view, stress is a subjective feeling, or physical reaction which is caused in response to stressful situations or events. According to this approach, what matters is the way one perceives experiences and reacts to the situations occurred in one's life. Therefore, stress is a result of one's insufficient adjustment to work, bad relationships and the existence of psychological or physical violence in the workplace, as well as conflicts between one's roles at work and the personal life (European Agency for Safety and Health at Work, 2007).

Especially air traffic controllers have been found to have increased levels of job stress due to their working conditions, such as important, accurate and on-time decision making process and their responsibilities (Kuo et al., 2012). The main characteristic of this job is that air traffic controllers work in "complex and dynamic environment that requires practitioners to attend to multiple events, anticipate aircraft conflicts and comprehend or make sense of evolving scenarios" (Malakis and Kontogiannis, 2013, p. 327). The increased stress levels of air traffic controllers based on their job characteristics is justified also by the assumption of Malakis and Kontogiannis (2013, p. 327) with regard to the mental picture of this group of employees. More precisely, the authors state that air traffic controllers "tend to maintain a selective representation of traffic flows based on a few salient traffic features that point out to interesting events (e.g., potential conflicts) [...] Cognitive maps, representing standard and non-standard air traffic flows, emerged as an explanatory framework for making sense of traffic patterns and for reframing mental pictures". This is even more important in this group of employees, since on the one hand air traffic controllers are responsible for public safety and on the other there is an increased air traffic during the last decades, as depicted in the following figure.

Figure 1. Actual and anticipated growth rates of low-cost and full-service airlines compared, 1996-2010



Source: Harvey, 2007, p. 18

Occupational stress and burnout have a negative effect on job performance. Job performance is defined as “behaviours engaged in by employees at work that are in keeping with the organizational goals” (Khosa et al., 2014, p. 6). The importance given to employee performance derives from the fact that it can boost the economic growth and the high living standards, while is an important factor in promoting and maintaining social and economic growth. Furthermore, employee performance is a crucial factor for organizational performance (Maarleveld and de Been, 2011; Khosa et al., 2014). At this point it is worth mentioning that the performance can be defined as the ratio of input - output in a specific time - period, with emphasis on quality and effectiveness, i.e. the achievement of objectives. Moreover, according to Khosa et al. (2014) employee performance is the result of ability, multiply by effort, multiply by support. Kazmi et al. (2008) claim that job performance is the result of the following three factors: a) skills (knowledge, abilities and competencies); b) effort (the degree of motivation that an employee puts forth toward accomplishing a job / task); c) nature of work (the degree of accommodation of these conditions in facilitating the employee’s productivity).

According to other group of studies, there is a number of factors that play an important role in employee performance. One of them is motivation. Other factors are the following: the working environment and its elements such as noise, lighting, temperature, employees’ desk and personal space, access to communication technologies, provision of information and feedback to employees from the managers regarding the organization, the participation of employees in the decision-making process, job analysis, fair employee assessment, as well as employee education and training.

Ali et al. (2014) found in their study that increased levels of occupational stress derive from workload, not sufficient economic reward and role conflict, which lead towards decreased employee productivity. In another study, Ali et al. (2013) found that apart from workload, other job stressors are long working hours, poor relationships with colleagues, organizational changes, poor support from the management, as well as lack of autonomy and control at work. Finally, Chovwen (2013) found that predictors of occupational stress leading to poor employee performance were perceived leadership style and emotional intelligence, apart from the job characteristics.

It is supported that human resource management can help in the decrease and prevention of occupational stress of employees, through various human resource management practices, as for example the provision of support services, the respect to occupational safety and hygiene guidelines, employee evaluation, decrease of workload, improvement of the working environment, employee training and education, employee motivation and reward. Human resource management refers to the design of those systems that enable an organization to exploit its human resources in the most efficient and effective way, so as to achieve its objectives (Mathis and Jackson, 2011). For this reason, human resource management refers primarily to the recruitment and selection process of the proper employees, based on the needs of the organization (Barrows and Powers, 2009; Mathis and Jackson, 2011).

Human resource management aims to strategically develop the human resources of an organization, using various methods and techniques in order to help in the creation and retention of a competitive advantage for the company. Consequently,

human resource management aims at ensuring that the skills of human resources are used effectively, in order the organization to achieve increased efficiency and profitability and the employees to acquire tangible and intangible benefits (rewards) from their work. Based on the above, one can understand that human resource management can lead to prevention, or even a decrease, of occupational stress and burnout of air traffic controllers. For instance, the proper training of air traffic controllers is the main reason for which it was found that despite the stressors in this working environment, the employees do not report increased blood pressure.

In order to address the symptoms of anxiety in the workplace, one needs to change all those factors associated with the occurrence of anxiety and burnout. More specifically, according to Pretrus and Kleiner (2003), these factors are:

- Changes in the characteristics of work: multitasking, increased control of the employee on the work undertaken, adequate task completion time, worker skills equivalent to those required by the job
- Changes in the workplace: increased comfort, greater safety of employees
- Changes in organizational practice: communication and guidance from the leadership about how to resolve problems that occur in the workplace, adequate opportunity advancement, development and promotion, clear job description and required knowledge, abilities and skills, fair division of labor, absence of any type of harassment

## 2. LITERATURE REVIEW

### 2.1 Occupational Stress

#### 2.1.1 Definition of occupational stress

Work-related stress is the reaction that many people have when they are pressured in their workplace for a long period of time. Occupational stress can be defined as the harmful physical and emotional response that occurs when job requirements do not match the capabilities, resources or needs of the employee (International Programme "Stress Prevention Activities", 2006; Khosa et al., 2014). According to another definition (Khose et al., 2014, p. 3): "occupational stress occurs whenever job-related stimuli cause a job holder's experienced activation level to deviate substantially from one's characteristic level of activation. That is, when an employee's resources have reached disequilibrium, the employee will experience an elevated level of strain. Therefore, occupational stress may occur under certain conditions and not others and be experienced by some individuals and not others". Finally, Munir and Mehmood (2013, p. 180) define occupational stress as "incapability of employees to manage the job pressure due to gap of job demands and employees capabilities to fulfill the job needs".

Stress is inherent in every human activity. Albrecht et al. (2011) distinguish two types of stress. The first is the acute stress, which exists for a short period of time and it stems from unexpected stressors. The second is chronic stress, which exists for a long period of time, derives from unresolved issues or conditions and can lead to burnout, as it is going to be discussed later.

Although stress can be creative (Khosa et al., 2014), it can also be harmful, in case one reaches high levels. Many employees perceive the pressure and difficulties in the workplace as a challenge, which motivates them to work more efficiently. This challenge and the objectives that the employees have a priori set on the basis of organization's objectives, leads to the satisfaction of people from their work and the acquisition of more skills and abilities. However, when the pressure is continuous and / or at high levels than the employees can withstand, then it is converted to a negative concept of work stress.

#### 2.1.2 Causes of occupational stress

According to Nixon et al. (2011), stress in the workplace is related to: a) high demands, where at the same time employees have little control on how the work is performed; b) workplaces that are not comfortable or safe; c) organizational practices that do not enhance labor force participation. More precisely, it is supported that the factors that can be source of occupational stress are related to the following (Munir and Mehmood, 2013; Khosa et al., 2014):

- The organizational and work processes, such as working hours, workload, the level at which the capabilities and employee skills are related to and meet job requirements, as well as the degree of employee autonomy
- The conditions and the general work environment, such as the exposure of workers to physical and chemical risks (e.g. high heat, high noise, chemicals, and dangerous substances)

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- The communication within the organization, the changes that may occur in the work environment, as well as the workers' employment prospects
- The subjective factors, such as the existence of emotional and social pressures, lack of support to employees from the leadership / managers, as well as the inability to tackle these problems on behalf of the employees

An additional factor contributing to the genesis of stress in the workplace is the harassment and mistreatment of workers. More specifically, various researchers emphasize that the abuse of employers, derogatory comments, the fear - extortion of dismissal and in general the repeated verbal attack may lead to lack of interest and employee satisfaction from work, bad mood and anxiety disorder. Women are particularly vulnerable group, since they become victims of emotional bullying and sexual harassment. Thus, the treatment of workers with dignity, courtesy, without discrimination, and the creation of a safe and healthy working environment, along with the development of assistance units and structures, contributes to physical, psychological and social well-being of workers (Koukoulia, 2010).

In addition, Moustaka et al. (2010) claim that job stress can occur when the employee does not have the necessary skills and knowledge to meet the job requirements, or when the nature of work involves responsibility for the safety and the lives of other people, such as in medical professions. Furthermore, the study of Nixon et al. (2011) and Keshavarz and Mohammadi (2011) demonstrated that the lack of autonomy of the workers and their limited control concerning the performance of their tasks, the gap between employees' knowledge, abilities and skills and the necessary knowledge, abilities and skills so as to perform the tasks and responsibilities assigned to them, as well as the unclear job role can contribute to the emergence of anxiety symptoms. People whose job is demanding, has much pressure, and a low degree of control, along with the family obligations, can lead to higher levels of job stress. The fact that the lack of the necessary knowledge and skills, the unclear job role and job description, and the workload are factors that can lead to job stress, is also mentioned by Keshavarz and Mohammadi (2011) and Nixon et al. (2011).

The study of Slattery et al. (2008) indicated that the practices used by an organization for the development of newly hired employees were found to be negatively correlated with uncertainty and conflict roles, which are factors that can cause job stress. However, stressor factors related to the role of the employee in the organization, namely one's responsibilities and duties, were found to be positively correlated with the intention of the employee to resign and negatively correlated with the job satisfaction and employee commitment to the organization.

Apart from the above, gender was found to be related to employee stress levels, as men traditionally faced greater insecurity in their work and are more exposed to work-related stress than women, especially traditional women, namely those who do not consider that there is equality between men and women.

In general, based on the above analysis, the sources of job stress fall in several categories, as presented in the table below.

**Table 1. Sources of job stress**

General causes of job stress	Specific sources of job stress	Job stress factors related to employees' duties
Organisational problems	Unclear job description	Difficult customers or demanding superiors
Non-sufficient support from upper-level hierarchy	Conflicting roles	Insufficient education
Workload or many lonely hours at work	Utopian high expectations (perfectionism)	Emotional relationships with customers or subordinates
Low job-related status, low earnings level, little possibilities of professional development	Lack of ability to influence decision-making	Non-existence of support from colleagues
Bureaucracy	Conflicts with superiors / colleagues	
Uncertainty and job insecurity	Isolation from colleagues' support	
	Lack of variety	
	Non-sufficient communication	
	Improper leadership	
	Inability to complete a job assigned	

Source: Processed by the researcher

The following table summarizes those factors that are related to the creation and existence of stress in the workplace environment.

**Table 2. Risks associated with occupational stress**

Work content	<ul style="list-style-type: none"> <li>❖ Monotonous and trivial tasks</li> <li>❖ Lack of variety</li> <li>❖ Unpleasant and / or odious tasks</li> </ul>
Workload and work-related pace	<ul style="list-style-type: none"> <li>❖ Work under strict time pressure</li> <li>❖ Workload</li> </ul>
Work schedule	<ul style="list-style-type: none"> <li>❖ Strict or flexible working hours</li> <li>❖ Non-scheduled working hours</li> <li>❖ Improper shifts</li> <li>❖ Many and lonely hours</li> </ul>
Involvement and control	<ul style="list-style-type: none"> <li>❖ Non-participation of workers in the decision-making process</li> <li>❖ Lack of control</li> </ul>
Career, salary, job position	<ul style="list-style-type: none"> <li>❖ Job insecurity - fear of dismissal</li> <li>❖ No future prospects / promotion</li> <li>❖ Fuzzy, biased and unfair / merit pay systems</li> <li>❖ Not fair and improper employee performance evaluation systems</li> <li>❖ Existence of many or few skills for a job</li> </ul>
Employee role in the organization	<ul style="list-style-type: none"> <li>❖ Unclear role</li> <li>❖ Conflicting roles concerning the same job</li> <li>❖ Continuous contact with other people's problems at the same workplace</li> </ul>
Interpersonal relations	<ul style="list-style-type: none"> <li>❖ Not good relations with colleagues</li> <li>❖ Harassment and violence</li> <li>❖ Insufficient or inadequate supervision and protection</li> <li>❖ No clear procedures for dealing with problems and complaints of workers</li> <li>❖ Isolated or lonely job</li> </ul>
Organisational character	<ul style="list-style-type: none"> <li>❖ Non-adequate and poor communication</li> <li>❖ Poor and ineffective leadership</li> <li>❖ Lack of clarity on the objectives and structure of the organization</li> </ul>
Interaction between family and professional life	<ul style="list-style-type: none"> <li>❖ Conflicting demands between family and professional life</li> <li>❖ Lack of support from the workplace to the problems faced by the employee concerning family life</li> <li>❖ Lack of support from family/friends to the problems faced by employees concerning work</li> </ul>

Source: International Programme "Stress Prevention Activities", 2006

### 2.1.3 Consequences of occupational stress

#### 2.1.3.1 Physical and psychological impact

Stress can lead to employees' psychological, physical and behaviour problems. More specifically, anxiety and depression are the most common psychological symptoms of stress, while at a physical level occupational stress leads to increased blood pressure, upset stomach, excessive sweating, headaches, insomnia, dizziness, eye pain, disorders in appetite, back pain and other musculoskeletal problems, as well as dampened initiative and increased rigidity of thought. In addition, the studies of Nixon et al. (2011) and Wellens and Smith (2006) showed that both cortisol levels and blood pressure are at first affected by work-related stress.

On the contrary, Wellens and Smith (2006) found in their study that mood and work performance are not affected, while they claimed that there are no symptoms of fatigue. Moreover, the research of Edwards et al. (2007) shows that the stressor factors existing at the workplace lead to reduced work performance, whereas factors that are stressors but are not work-related found to influence employee performance. The results of these studies show that the human body can cope with a high stress level if it is temporary, through relaxation and rest. However, there are chronic health-related problems when an employee is exposed to chronic stress at work, even if the stress level is low. The following table summarizes the consequences of occupational stress.

**Table 3. Impact of occupational stress**

Physical impact	Headache, stress, indigestion, shortness of breath, rashes or skin irritations, colds, recurrence of old diseases, fatigue, relaxation weakness, nausea, sensitivity to allergies, excessive sweating, tight fists, blackouts, constipation or diarrhea, fast weight gain or loss
Mental impact	Inability to concentrate, restlessness, mistakes, muddled thinking, persistent negative thoughts, difficulty in making decisions, bad dreams or nightmares, less intuition, lower sensitivity, false crisis, short-term and not long-term thinking, hasty decisions
Behaviour impact	Lack of sociability, continuous restlessness, lying, careless driving, alcohol drinking and smoking, crying, constant conflicts, belligerence, refusing tips and suggestions, using solutions that are known to be unsuitable, criticism of other people, vandalism, delay and quick departure, long breaks, passivity and lack of commitment
Emotional impact	Nervousness, tension, mood shifts, alienation, sense of dissatisfaction, fear and panic attacks

Source: International Programme "Stress Prevention Activities", 2006, p. 13

One more manifestation of stress is anxiety (Lesiuk, 2008). In fact, "State Anxiety is an unpleasant emotional experience, a transitory emotional condition or feeling state that is characterized by subjective, consciously perceived feelings of tension and apprehension, and heightened autonomic nervous system activity" (Lesiuk, 2008, p. 2).

### 2.1.3.2 Burnout

One major symptom of stress is burnout (Munir and Mehmood, 2013). Due to the importance of burnout in one's personal and professional life, this section will discuss in detail this symptom. The term 'burnout' was at first used by Freudenberg in 1974 in order to describe the symptoms of mental and physical exhaustion of professionals in the mental health sector (Theophilou, 2010). Freudenberg defined burnout as the first experience on the one hand of exhaustion, and on the other of the success seen in social workers, due to the demands of their job, in terms of skills, energy and effort (Karakostas, 2014). However, the most widely used definition of burnout was given by Christine Maslach in 1982, according to which burnout is defined as follows: the reduction of the interest of a person for his / her colleagues and superiors, the emotional exhaustion that results in negative feelings and lack of respect to clients / patients, as well as physical exhaustion.

The steps leading to the emergence of burnout are the following, not in priority order: a) emotional exhaustion, which consists of physical and mental fatigue, and decreased energy levels and mood; b) depersonalization, which refers to the withdrawal of employees from their clients, and the replacement of beforehand close and positive relationships with aggressive, cynical and impersonal relationships; c) feeling of reduced personal achievements, which refers to the feeling of the employees that they do not have the necessary skills to cope with the demands of their work and which leads to reduced profitability and productivity.

Burnout derives primarily from the exposure of an employee to chronic stress (Lloyd et al., 2002), while Theophilou (2010) argued that burnout is caused by long-term exposure of an individual to emotionally demanding situations. Factors that can lead to the emergence of burnout are the following (Anagnostopoulos et al., 2014): not suitable organizational environment, lack of staff, reduced economic earnings, long working hours, reduced employee participation in decision-making, reduced control of the employees regarding the performance of their duties, decreased ability to manage stress and work stress, low levels of self-confidence, role ambiguity, lack of support from colleagues and / or supervisors, and the lack of communication within the organization.

The empirical approach to burnout began in the 1980s with the publication of the Maslach Burnout Inventory. Since then, many researchers have examined this issue, advocating that burnout can lead to the following (Li et al., 2013): a) emotional exhaustion, in which employees feel that they cannot offer to their work emotionally, b) feeling of reduced personal achievement, where employees are characterized by increased levels of non-job satisfaction, c) reduced sense of competence and low assessment of their personal achievements, d) depersonalization, where employees show signs of lack of interest to clients, e) lower levels of prosperity, f) reduced productivity and efficiency, and low energy levels, g) increased levels of absenteeism, h) reduced organizational commitment, i) conflicts in the social lives of employees, contributing to a reduction of the overall organizational performance, i) errors in work.

#### 2.1.4 Occupational stress and employee performance

As alluded to, work-related stress and the subsequent burnout has a negative impact on employees' health and consequently on the productivity, which results in a negative effect on organizational performance through absenteeism, increased staff turnover, reduced job satisfaction, reduced organizational commitment, decreased compliance to organizational control and so forth (Affum-Osei et al., 2014). There are a number of studies concerning the relation between occupational stress and employee performance.

Imtiaz and Ahmad (2011) claimed that occupational stress affects negatively employee performance, through the negative impact of stress on job satisfaction and the acquisition of new knowledge and skills. Menze (2006) claims that occupational stress results in job dissatisfaction, lack of commitment to the organization, increased absenteeism, lack of motivation in work, and increased turnover intention. Khosa et al. (2014) add that job-related stress and burnout results among other in increasing complaints on behalf of the company's clients, increasing unsafe working practices and accidents rates. Keshavarz and Mohammadi (2011) reported in their study that job stress affected negatively employees' overall commitment to their job, absenteeism due to medical problems, and decreased job satisfaction, whereas Munir and Mehmood (2013) found in their study that occupational stress affect negatively job performance due to the fact that it has a negative impact on organisational burnout.

Nevertheless, there are some studies, which demonstrate exactly the opposite. More precisely, Khosa et al. (2014) found in their study in nurses in South Africa that occupational stress and burnout do not have an impact on nurses' job performance. However, there is a plethora of studies, as discussed above, according to which occupational stress has a negative impact on job performance.

#### 2.1.5 Occupational stress in air traffic controllers

A number of studies have indicated that air traffic controllers experience increased levels of occupational stress. For example, Zeier et al. (1996) state that air traffic controllers do not know when a situation may become critical and thus they are not able to regulate their workload. The increase in air traffic (Jou et al., 2013), the complexity of air traffic management especially due to the interrelation between the human factor and the softwares used (Kirwan, 2001; Teperi et al., 2015), as well as the continuous flow of information generated by an interleaved net of Communication, Navigation and Surveillance (CNS) systems (Malakis et al., 2010) impose more responsibilities and increased workload to air traffic controllers, who should be able to cope with multiple goals and manage intensive tempos of operations. To be more precise, Malakis et al. (2010) mention some characteristics of the air traffic controllers' job position: a) transition from normal to abnormal situations; b) limited available time for decision-making; c) errors can be disastrous; d) air traffic controllers have some degree of freedom; however, their decisions may be in conflict with other goals; e) there may be different and conflicting goals. Segal et al. (1998) also mention that air traffic controllers work in a stressful environment. Similarly, Lesiuk (2008) argues as well that air traffic controllers have to face increased levels of stress, especially in crisis events, as in the case of the terrorist attack in the U.S.A. in 9/11.

In 1982, a series of studies conducted by Rose et al. examined the impact of stress on physical symptoms in the case of air traffic controllers. At first, Rose et al. (1982a) indicated that air traffic controllers reported high plasma cortisol concentrations, which reflect the working environment and more precisely the high demanding situation of their job position. Moreover, Rose et al. (1982b) mention that air traffic controllers had increased plasma cortisol in the case they were responsible for more airplanes, indicating that increase of responsibilities, and thus workload and high demanding situations, increase the plasma cortisol concentration. Increased levels of plasma cortisone concentrations have been found to be associated with higher stress levels (Sloman et al., 2001). Moreover, it was found that air traffic controllers who had increased levels of job involvement, impulse control problems, subjective distress and alcohol abuse were reported to have again high average cortisol values (Rose et al., 1982c).

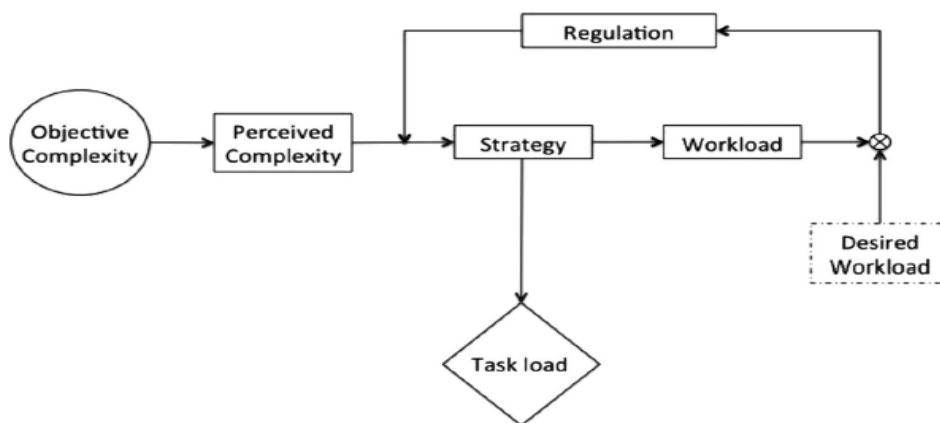
Zeier et al. (1996) mention that air traffic controllers have a stressful job, which is related to increased levels of salivary immunoglobulin A and concentration of salivary cortisol. Increased salivary immunoglobulin A were linked to positive emotional engagement of air traffic controllers with their job position, whereas increased salivary cortisol was linked to actual or perceived workload. Kuo et al. (2012) examined the turnover intention of air traffic controllers in Taiwan. The results of the study indicated that increased occupational stress results in increased turnover intention through a direct



relationship. Moreover, job stress has a negative indirect impact on turnover intention through job satisfaction. In addition, Kuo et al. (2012) did not find any relationship between turnover intention and job performance, whereas they found a negative relation between occupational stress and job performance. Similarly, Jou et al. (2013) report that traffic controllers in Taiwan have increased turnover intention due to the job stress, and more precisely due to the following stress factors in the following order: workload, family factors, and job satisfaction. Moreover, work environment and role conflict had indirect effect on turnover intention, while job satisfaction had a mediating effect between occupational stress factors and turnover intention.

Last but not least, Tobaruela et al. (2014) developed a model in order to estimate air traffic controllers’ mental workload, which is linked to increased levels of stress, as discussed earlier. According to this model, workload depends on one major characteristic of this job: complexity. This complexity includes both physical and mental, or else, objective and perceived complexity. More precisely, “objective complexity represents the complexity of the scenario based on quantifiable factors”, whereas perceived complexity refers to “the ATCO-independent complexity, referred to as system complexity; the cognitive complexity associated with the mental picture of the ATCO; and the perceived complexity, the ATCO’s perception of the complexity of their mental representation. The complexity perceived by the ATCO will directly influence the strategy chosen to control the traffic, and therefore the workload experienced” (Tobaruela et al., 2014, p. 60). Based on the above, the workload of air traffic controllers is depicted in the following figure.

Figure 2. Representation of air traffic controllers’ workload



Source: Tobaruela et al., 2014, p. 61

As it can be seen from the above figure, for a given level of objective and perceived complexity, air traffic controller has to choose a specific strategy, based on his / her individual preferences, and in accordance to the existing regulation.

## 2.2 Human Resource Management

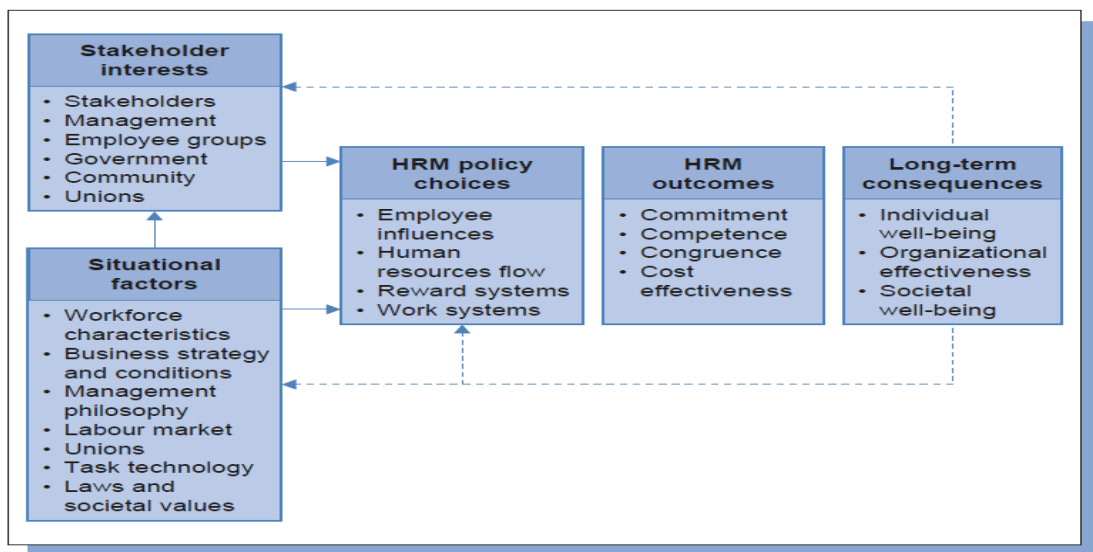
### 2.2.1 Definition and aim of human resource management

Initially, human resource management the administration had more management function, based on the traditional model of human resource management. As highlighted by Mathis and Jackson (2011), this means that the function of human resources management placed emphasis on the production and the action-response relationship, while considered workers as another expense, with no connection between this operation and the company's mission. This, however, changed over time, and nowadays employees play an extremely important role in the mission of the company, without being considered as an expense but as an investment, since human resource management has a more strategic orientation.

Many researchers support that the effective management of human resources has a positive impact on organizational performance (Luo and Milne, 2014). This finding lies on the fact that human resources, under the term 'human capital' is the primary factor that contributes to a great extent to the creation of value for the customers of the company and thus to sustainability through the maintenance of competitiveness, achievement of a higher market share and profitability (Walls et al., 2011).

Based on the above one can understand the enormous importance of human resource management for an organization. The individual functions of human resource management are the following: recruitment and selection of employees, employee satisfaction from their work, motivation and assessment of employees. According to Harvard model of Beer et al. (1985, as cited in Tyson, 2006) that is illustrated below, human resource management is that system linking the company's goals with the needs of society and transforms them back into human resources management functions. This model describes the direct relationship between business and society. However, this model fails to demonstrate how the objectives of the organization constitute a factor that determines the strategies and policies of human resource management.

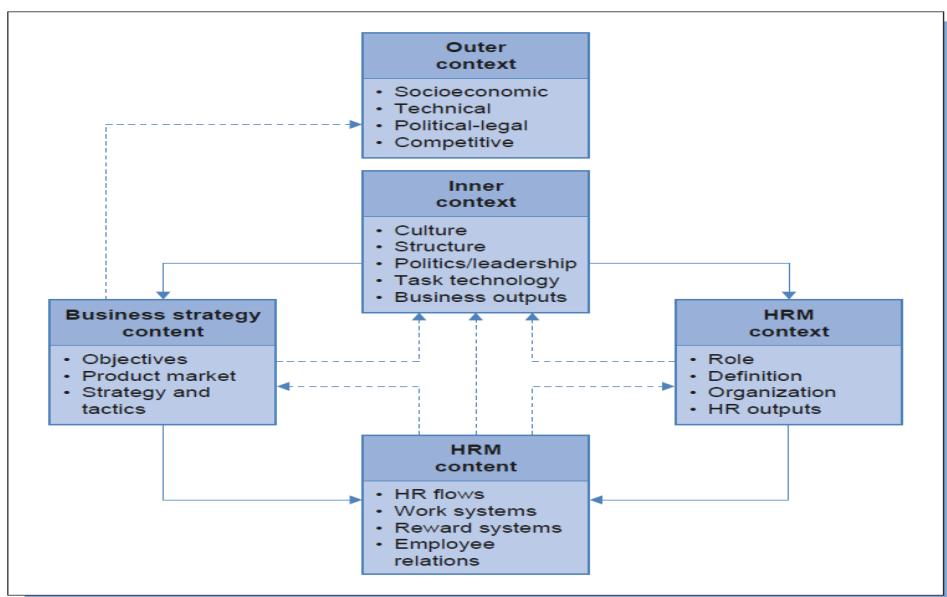
Figure 3. Harvard model of Beer et al.



Source: Tyson, 2006, p. 86

Other researchers have tried to show that human resource management is a process where there are interrelated decisions arising from the business strategy, as for example expansion into new markets. This approach is illustrated in the figure below.

Figure 4. Model linking business strategy and human resource management



Source: Tyson, 2006, p. 87

### 2.2.2 Functions of human resource management

According to international literature (Mathis and Jackson, 2011), human resources management is actively involved in a variety of activities. More specifically, the functions-responsibilities of an organization's human resources department are the following:

- Strategic design
- Redesign of duties / work
- Decision making with regard to mergers, acquisitions, internationalization, cease of operations
- Organizational adjustment to the changes occurred in the wider environment in which the organization operates
- Financial transparency
- Selection and recruitment of staff
- Employees education and training
- Employees remuneration strategy
- Shaping of the organizational culture
- Harmonization of policies with legislation

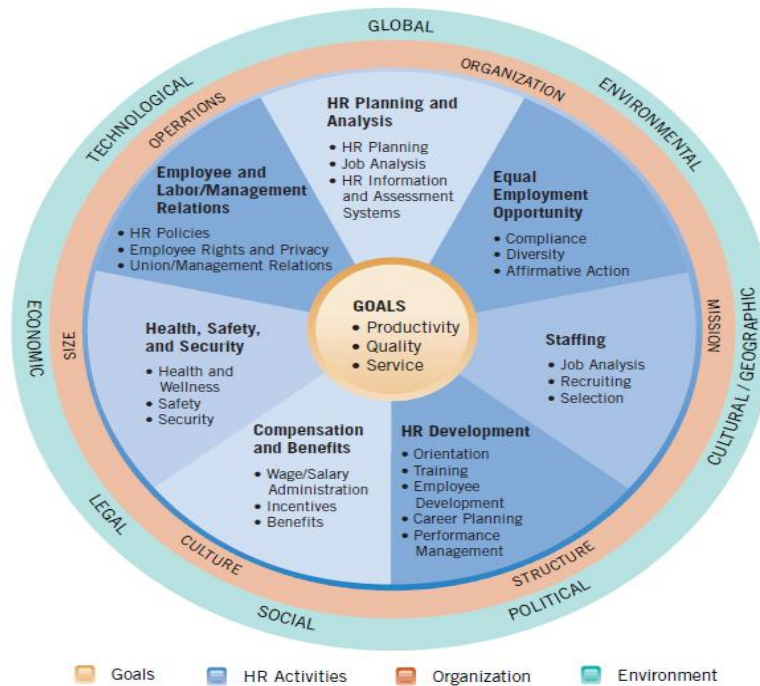
Overall, the human resources department is responsible for: a) the analysis, formulation and presentation of programs and processes in matters regarding personnel, which contribute to the efficient use of human resources and the organizational efficiency; b) the support to and service of, as far as possible, all departments in all major phases of personnel management; c) the undertaking of the necessary actions that will ensure the organization a sufficient and competent workforce for the present and for the future; d) the continuous research, evaluation and reporting of the results and effectiveness of personnel activities related to its contribution to the achievement of the organizational objectives.

In addition, Mathis and Jackson (2011) mention that human resource management has three major roles: administrative, operational and strategic. The administrative role is related to the collection and retention of information for the employees, such as management of compensation claims, and communication with public institutions. Technology has helped a lot the organizations at this field. According to the operational role, the human resource department determines and implements operational programs and policies in the organization. The strategic role of human resource department plays emphasis on the fact that human capital is of great importance and value and represents organizational investments. According to this role, human resource department focuses for example on the demographic changes and how these affect human capital, as well as to the availability of human resource.

As it can be seen from the figure below, the functions of human resources management should contribute to organizational success. The key factor is to ensure that these functions support the efforts of the organization based on (Mathis and Jackson, 2011):

1. **Productivity:** the continuous increase in productivity, as it is measured on the basis of the work of all employees, is even more important nowadays, given the major increase in competition. The productivity of workers in a company is strongly influenced by the efforts of management, the organizational programs and the company's policies
2. **Quality:** The quality of products and services affects the success of the organisation in the long term. The reputation that a company offers low quality products and services may result in reduced growth and poor performance. The emphasis on quality requires continuous improvements and redesign of business processes. Apart from the traditional performance evaluation methods, the perceived value by customers and their satisfaction level are equally important
3. **Service:** when providing services to clients not only managers, but also employees should be involved. In order to provide high quality services and resolving problems associated with this supply, the organization may need to redesign processes, to implement changes in organizational culture, changes in leadership, as well as changes in practices and policies implemented by the human management department resources

Figure 5. Functions of human resource management

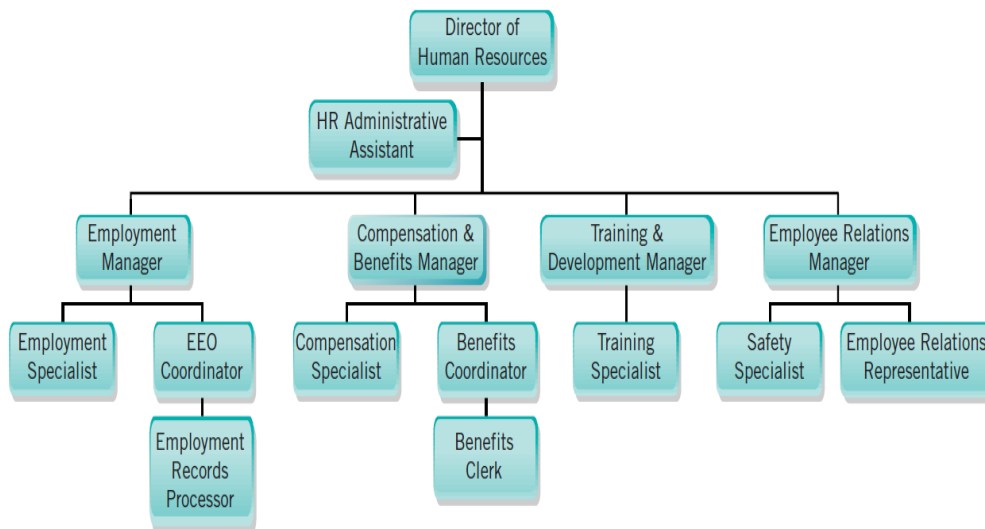


Source: Mathis and Jackson, 2011, p. 11

In order to achieve all the above mentioned, the human resources management department should perform the following functions: a) planning of human resources; b) ensuring that all have equal job opportunities; c) personnel selection; d) development of human resources; e) establishment of systems for rewards and compensation; f) ensuring health and safety at work; g) handling the relations between employees and between employees and management

In general, a human resource department include the actions of recruitment, human resource planning, staff training and staff development, compensation policies, health and safety programs, benefits and services for personnel, labor relations and research, whereas the following actions can also be added: monitoring of the employees, motivation, leadership, group behavior, communication and human relations. A schematic representation of the human resources management’s functions is given in the figure below.

Figure 6. Typical HRM department structure



Source: Mathis and Jackson, 2011, p. 26

### 3. DISCUSSION OF FINDINGS

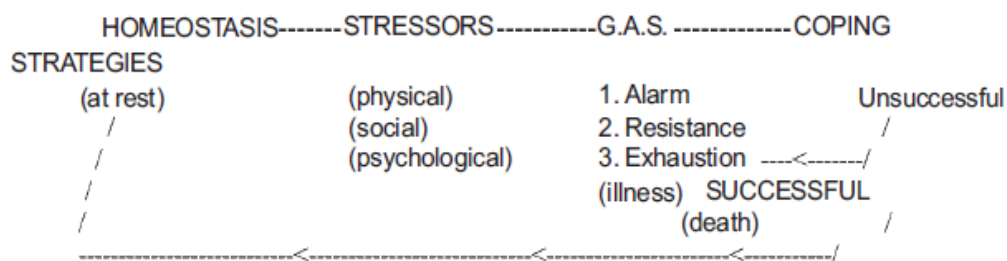
#### 3.1 How Human Resource Management can prevent occupational stress in air traffic controllers in the E.U.

In this chapter we discuss secondary research findings in order to examine, present and evaluate ways in which human resource management can prevent occupational stress in the case of air traffic controllers in the geographical area of the European Union.

##### 3.1.1 General stress management techniques at an individual and organizational level

In 1991, Mount developed a stress reaction/coping model, which is illustrated in the below figure. This model has its basis on the General Adaptation Syndrome (GAS) model designed by Selye. In the first stage, the person is at rest. When a stressor appears, the person moves to the second stage, the so-called resistance. At this stage there is a mobilization of the human body's resources, to as to cope with the stressors. The third stage is exhaustion, where the human body has exploited all its resources, which can result in severe illness, and the symptoms discussed earlier in the first chapter.

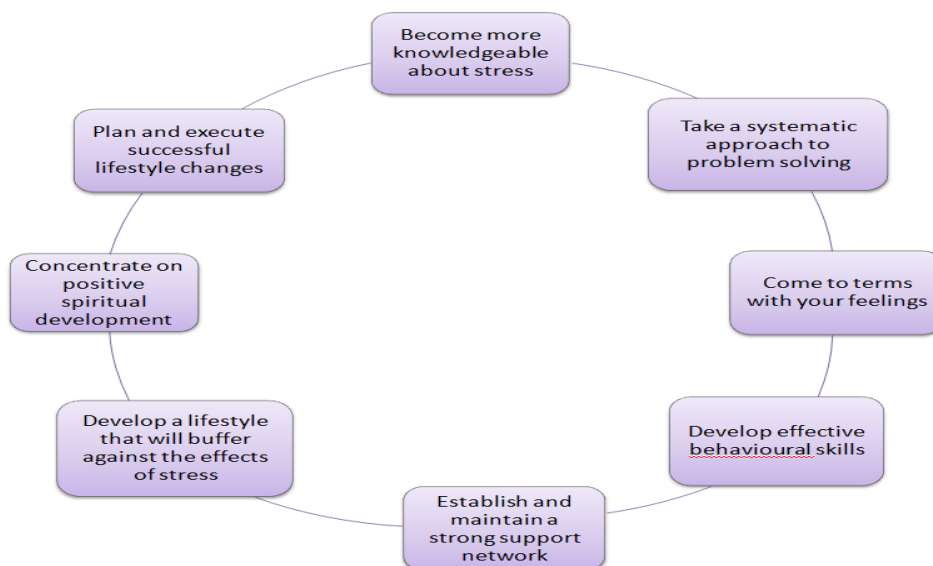
Figure 7. Mount's stress reaction/coping model



Source: Mount, 2002, p. 86

One more model proposed for coping with stress is the model created by Stranks (2005), which is depicted hereunder. The characteristics of this model is that it proposes a number of ways so as an individual can cope with stress. Even though this model is based on methods that appear to be effective at an individual level, and not at an organizational, it can be useful in case the organization provides such services to its employees, namely support services helping them to reduce stress and anxiety and effectively cope with occupational stress and burnout.

Figure 8. Stranks's (2005) model for coping with stress



Source: Stranks, 2005, p. 67

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The same applies to the following stress management methods mentioned by Tummers (2013). More precisely, these methods can be used both at an individual and organizational level, from the support services that the organization provides to its employees. These methods are categorized in groups, according to the following areas:

- Physical wellness: Breathing, Healthy eating, Massage Therapy and Therapeutic Touch, Exercise, Relaxation, Sleep
- Emotional wellness: Laughing, Dealing with difficult emotions, Self-assessment of an anger situation, Dealing with fear
- Intellectual wellness: Mindfulness (breathing and meditation), Changing from distorted to realistic thinking, stopping negative self-talk, Shifting the locus of control, writing affirmations, Goal setting and problem solving, Money management, Time management, Managing time-journal activity program
- Social wellness: Interpersonal communication skills, Active listening, Conflict resolution, Animal-Assisted activities
- Spiritual wellness: Altruism, Forgiveness, Gratitude, Reading inspirational words, Spending time with inspiring people, Spending time in nature
- Environmental wellness: Aromatherapy, Colour, Ergonomics, Sound/Noise, Light, Natural surroundings

In general, within the context of the provision of support services from the organisation to the air traffic controllers with regard to stress management and occupational stress reduction, it should be mentioned that the measures that can be employed fall into the three following categories (Kinman and Jones, 2005; Tiyce et al., 2013):

- a) Prevention: prevention consists of risk assessment, provision of support services to the employees so as to manage stress effectively at an individual level, measures aiming at occupational health and safety that reduces the risk to which employees are exposed, improvement of the working conditions within the organization, as well as support from the managers.
- b) Timely and correct response: timely and correct response consists of the action taken in order to reduce, or even to eliminate the symptoms that have been resulted from stressful and anxiety conditions, as for example provision of support services at an organizational context from a specialist in stress management (e.g. organizational psychologist), support from management, improvement of working conditions, and changes in the working processes.
- c) Rehabilitation: rehabilitation consists of the provision of support services to the employees

### 3.2 Risk assessment

In general, the measures that are associated to the prevention and handling of stress in the workplace can be divided into three categories:

- Prevention: includes activities related to monitoring and risk assessment, training of workers for stress reduction, actions taken towards reducing the exposure of employees to various risks (e.g. noise, improper temperature), clear definition of the organization's objectives, support by management, improve employee personal space and working conditions
- Timely and proper reaction: includes support from management and activities related to solving the problems presented either by the team or the leadership, such as administrative and workplace redesign and improvement of working systems
- Rehabilitation: includes process support, such as advice to employees so as to enable them to deal effectively with their problems

### 3.3 Occupational health and safety

The responsibilities of human resource department regarding occupational health and safety focus on the following:

- Assessment of the risks to which workers are daily exposed
- Development of a strategy to address these risks
- Keeping workers informed about the risks to which they are exposed and on how they can protect themselves from these risks
- Provision to the employees with the appropriate protective equipment

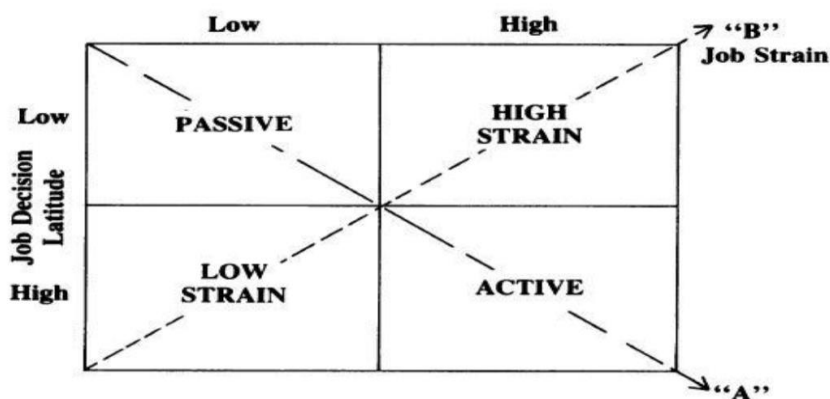
- Communication with the employees about the risks they face, and how they can participate in decision-making about the best way in dealing with risks
- Monitoring and evaluation of the strategy that has been outlined from the organization in order to prevent and address risks to which workers are exposed

**3.4 Other measures**

**3.4.1 Locus of control**

The study of Karimi and Alipour (2011) place emphasis on how human resource department can utilize job demand-control models, depicted in the figure below, so as to reduce occupational stress, through locus of control.

**Figure 9. Job demand-control model**



Source: Karimi and Alipour, 2011, p. 236

Locus of control can be defined as “the general belief that individual’s successes, failures and outcomes are control by individual’s actions and behaviors (internal);or perhaps, people’s achievements , failures and outcomes are controlled by other forces like chance, luck and fate (external)” (Karimi and Alipour, 2011, p. 233).

**3.4.2 Music therapy**

One interesting study was conducted by Lesiuk (2008), who examined the effect of preferred music listening on stress levels of air traffic controllers. According to the results, both listening to music and sitting in silence resulted in a decrease in psychological anxiety, but there was not reported a decrease in psychological indicators of anxiety, such as mean arterial pressure and heart rate. In other words, no difference was found in stress anxiety levels between those who listened to their preferred music and those sitting in silence. Especially for the group that was characterized as being high-trait anxiety and introverted, there was no decrease in state anxiety. This means that sitting in silence can effectively reduce anxiety and mindfulness-based stress. Another justification of this result is that the music genre preferred by the air traffic controllers did not helped them in reducing anxiety. However, it was also found that listening to preferred music genre was perceived by air traffic controllers as enjoyable and stress reduction technique.

**4. CONCLUSIONS-RECOMMENDATIONS**

Stress is related to many factors: organizational and work processes, the general work environment, the communication within the organization, the harassment and mistreatment of employees, difference between employee knowledge and skills and job position requirements, the unclear job role and job description, workload, the role of the employee in the organisation, interaction between family and professional life, interpersonal relations, control and autonomy, work content (Takaki et al., 2013; Khosa et al., 2014)

The above analysis indicated that air traffic controllers constitute a group of employees who face increased occupational stress, due to their job characteristics and more precisely: the increased air traffic, the complexity existing in air traffic management due to the exploitation of new tools and the flow of information (Teperi et al., 2015), the sudden incidents that increase their workload and call for immediate, accurate and reliable decision-making for the safety of people (Tobaruela

et al., 2014). All the above increase the job stress experienced by air traffic controllers, resulting in physical symptoms, and increased turnover intention (Kuo et al., 2012; Jou et al., 2013). This issue is even more important in the case of air traffic controllers, due to the fact that they are responsible for the safety of many people every single day. Thus, in response to the first research question, this study concluded that air traffic controllers is a group of employees that faces increased levels of occupational stress, since there are many stressor factors related to the nature of their job.

In addition, the above analysis indicated that occupational stress has a negative impact on the actual job performance. In general, occupational stress has been found to be related to health-related problems (e.g. blood pressure, headaches, insomnia, dizziness), and the well-being of employees (Keshavarz and Mohammadi, 2011). Moreover, stress can lead to burnout, which in turn results in emotional exhaustion, feeling of reduced personal achievement, reduced sense of competence and low assessment of personal achievements, absenteeism, reduced organisational commitment, and depersonalization, (Anagnostopoulos et al., 2014).

However, one of the most severe effects of stress is reduced employee performance, through decreased job satisfaction, turnover intention, reduced organisational commitment, absenteeism, decreased compliance to organisational control, and burnout (Khosa et al., 2014).

It is supported that human resource management in the airline industry has an immediate effect on employee attitudes, as they are reflected in job satisfaction, organizational commitment and commitment to the union. Similarly, Kazmi et al. (2008) argue that the prevention and the management of occupational stress requires organizational level interventions, because the organization is the primary cause of stress. Thus, the success in preventing and effectively managing job stress will depend on the culture of the organization and the methods implemented. At first, there should be a culture of openness and understanding, and not a culture of criticism (Kazmi et al., 2008). It is recommended that organizational support services should be provided to the employees, in order to be able to cope with the physical, social and psychological impact of occupational stress on their health, psychological well-being, behaviors and attitudes towards the organization, and finally their job performance (Akintayo, 2012)

Based on the literature review, it was indicated that human resource management can implement methods and practices that will allow the effective prevention and management of occupational stress of the employees. More precisely, the above analysis provided evidence that the following practices at an organizational context can lead towards the prevention and reduction of occupational stress: lowering the work load, creating a positive and stable organizational culture, abate the role conflict, pay adequate salary and rewards according to employees' skills and effort, respecting the guidelines that refer to occupational health and safety, provide training and education to employees so as to increase their knowledge and skills that leads toward increased job satisfaction and productivity, implementing an adequate and proper employee performance appraisal method, and providing counseling to employees in order to reduce burnout and improve their job performance and job satisfaction (Kampkötter, 2014; Bardauskaite, 2014). Other measures that can decrease and prevent occupational stress in air traffic controllers with the help and support of managers and especially human resource department include: job demand-control models (Karimi and Alipour, 2011), music therapy creation of a positive and friendly organizational culture, where employees are aware of the company's goals, mission and vision (Munir and Mehmood, 2013).

#### 4.1 Recommendations

This study contributed to the existing literature with two ways, namely at theoretical and practical level. There is a gap in the literature with regard to stress faced by air traffic controllers. There are some studies examining the stress levels of air traffic controllers giving emphasis on the physical symptoms of stress, whereas there are some studies examining stress on air traffic controllers in specific countries, such as Taiwan. However, there are not so many studies that have been conducted in this group of employees and more specifically in air traffic controllers in countries of the European Union. Thus, this study tried to shed a light on this group of employees, through the review of the existing literature and the summary of all the studies that have been conducted. This study could also trigger and further enhance a public and academic dialogue regarding the occupational stress of air traffic controllers, and how this stress can be prevented, or even eliminated.

In addition, this study resulted in some practical implications. More precisely, the aim of this research was to examine the role of human resources in mediating the negative impact of occupational stress on job performance of air traffic controllers. Through the literature review it was indicated that human resource management can help employees prevent and reduce



their stress levels at work, through the following practices: creating a positive and stable organisational culture, offering proper and adequate motivation to air traffic controllers so as to increase their job satisfaction and productivity, following the European guidelines for occupational health and safety, providing counseling and support to employees, implementing an adequate and proper employee performance appraisal method. These results can be useful for the organizations, so as to rethink the role and functions of human resource department from a broader perspective, trying to implement methods aiming at preventing and reducing job stress levels of employees.

As alluded to, there is not enough literature, based on primary research, with regard to the stress faced by air traffic controllers, especially in the E.U. The above literature review indicated that the air traffic controllers are a rather neglected group of employees concerning the study of stress factors and how their stress can be mediated through the functions of human resources. In addition, some studies focused on the physical effects of stress, whereas others gave emphasis on air traffic controllers in Asian countries, such as Taiwan. Even though this was a major advantage of this study, namely to address this gap, the collection of secondary data related to occupation stress faced by air traffic controllers of the E.U. was rather difficult.

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