

## **CHAPTER 2**

# **JOB STRESS AMONGST FIREFIGHTERS**

This chapter encompasses an analysis of the literature which seeks to address the empirical aims of this research. In particular, this chapter aims to theoretically describe and analyse job stress amongst firefighters in the South African context.

The chapter will commence with a discussion of the uniqueness of the job context of firefighters as well as job analysis, which provide a contextual background. Thereafter, the chapter will be divided in two sections. The *first* section will focus on the description of stress in general, job stress and a job stress model. The *second* section will focus on the description of stressors and reactions and symptoms of job stress amongst firefighters. The chapter will be concluded by a summary.

### **2.1 THE UNIQUE JOB CONTEXT OF FIREFIGHTERS**

The unique job context of firefighters will be outlined by means of two real-life scenarios of the job environment of firefighters. The *first* scenario will focus on the terrorist attacks on the World Trade Centre in New York on 11 September 2001, and the *second* scenario on the raging inferno at Munitoria in Pretoria on 4 March 1997. These scenarios will indicate the perceptions, emotions and reactions of the ‘victims’ that firefighters must deal with during rescues. The job of firefighters is unique and firefighters need to possess certain

psychological characteristics, interpersonal skills and coping strategies to cope with job stress.

**(a) Scenario 1: Attacks on the World Trade Centre**

The firefighters watched in shock as the jetliner slammed into the north tower of the World Trade Centre and a huge ball of fire shot up in the sky. “We threw all our gig on the rig and we started to respond, down to the World Trade Centre,” Vancleaf said. Engine 7 was one of the first fire companies to arrive on the scene. “I remember taking an extra couple of seconds before running in to make sure we had everything and ... we were ready to go, because this was going to be a big one,” Vancleaf said (<http://www.cnn.com>).

“I said to Pete, ‘This is going to be the worst day we have ever had.’ Little did I know,” recalled Nigro. The three made it to the scene in less than 10 minutes. Ganci set up a command post on a ramp leading to a garage near the north tower. “We were standing with the chief and we heard somebody yell, ‘There is another plane!’” Mosiello recalled. “Then it came into the range of my hearing. It sounded louder and louder and louder and there it was ... it went right into the building, into (the south tower). Now we have a real problem on our hands. We have two buildings hit by planes. Thousands and thousands of people trapped” (<http://www.cnn.com>).

“While we were up, operating on the 21<sup>st</sup> floor, there was a sick vibration in the building,” Vancleaf said. Although Vancleaf did not realize it at the time, the vibration he felt was from the collapse of the adjacent south tower. “After that vibration, it was just something that was not right, and eventually I heard the order to vacate, to back out, to evacuate the building, “ he said (<http://www.cnn.com>).

Down below, the streets were filled with panicked people and clouds of smoke and debris from the south tower collapse. Chief Ganci and his assistants managed to escape from the makeshift command post and retreat into the basement of a nearby building. “The basement was full of dust. You could not breathe,” Mosiello said. “We could not find a way to get out. We finally found a staircase and we all got out.” Ganci told his men to set up a command post in a safer location, further north of the disaster. He ordered Mosiello to retrieve some backup and then the fire chief rushed back toward the scene to help with the rescue efforts (<http://www.cnn.com>).

By dusk, the firefighters of Engine 7 began making their way back to their station. “The first person I saw there was the captain, Captain Tardio,” said Vancleaf. “His first question to me was, where is everybody?” One by one, the firefighters returned. The entire team had escaped the north tower with just minutes to spare before the building came down. “I believe if we were two more floors up we would have been dead,” said Zoda. Chief Ganci was not so lucky. His body was later found buried under feet of debris. Mosiello helped recover his remains from the rubble, then had to give the Ganci family the bad news. (<http://www.cnn.com>).

**(b) Scenario 2: Raging inferno at Munitoria**

Twelve hours after the fire at Munitoria had started, firefighters breathed a sigh of relief that they had managed to prevent the fire from spreading to the South wing. The fire completely demolished the West wing – all that was spared was the council chamber where the Truth and Reconciliation Commission hearings were being held (Christoforakis, 1997).

The rescue operation started going smoothly once fire departments from other areas had joined in. Between 250 and 300 firefighters battled the blaze, making it the “largest fire

action operation in South Africa” said Pretoria chief fire officer C P van der Merwe. Departments from as far as Johannesburg, Brits, Alberton, Boksburg, Centurion, Midrand and Sandton sent their firefighters to assist (Christoforakis, 1997; De Nysschen, 1997; Van der Walt, 1997).

The South African Air Force sent a “pathfinder” that sprays 13 000 litres of water a minute. The fire spread rapidly through the West wing, engulfing the entire area by 2 a.m. yesterday. At around 3 am, when the fire was still out of control, firefighters contemplated blowing up the walkway between Sammy Marks Square and Munitoria, to prevent the fire from spreading to the shopping centre. This plan was later abandoned when firefighters managed to get the fire under control (Christoforakis, 1997).

Anthony Faul, an employee at Munitoria, watched in shock as his workplace burnt down. “I do not think we will ever be able to reconstruct all the documentation that was lost, it is just terrible,” he said. City spokesman Alet van Tonder said, “*It is a very sad day*. This was the nerve centre of the city for 28 years and the kind of information that was stored in here will never be rebuilt”(Christoforakis, 1997).

Many firefighters faced the largest and most dangerous fire they had yet encountered. Gavin Wakefield, of Benoni, was at the Pretoria fire department on a paramedic course when the fire broke out and he joined the rescue operation. “I experienced the scariest moment of my life in the building” he said (Christoforakis, 1997).

“There were some men trapped on the fifth floor and we were sent to get them. All around us the building was collapsing and we could just hear it, not see it, because everything was dark,” he said. “The noise kept getting louder and suddenly the roof collapsed over me,” he said. Mr Wakefield survived without injury and his trapped colleagues were freed

(Christoforakis, 1997).

A young Centurion firefighter believed he was just three minutes from death after he and his team were trapped by falling debris while fighting the fire on the sixth floor of Munitoria. Neels Botha (26), the son of Akasia's fire chief, also Neels Botha, was interviewed in his Muelmed Hospital bed. He said he had been a member of an advance team led into the building by Pretoria Fire Station officer Martin Kruger shortly after the fire broke out (Savides, 1997).

In order not to become lost in the darkness and dense smoke, the men routinely called out their designated numbers at every floor. Mr Kruger, a veteran of the SAAU building blaze in 1994, said: "When we reached the sixth floor the fire was intense and the heat extreme. Wearing oxygen equipment we called out our numbers once more, but the two men carrying the hose were missing"(Savides, 1997).

Mr Botha junior takes up the story. "It was extremely dark in the building, and we had no visibility. The heat and smoke were thick around us and we could hear flames everywhere. I was afraid, especially after we were stranded high up without a hose. When I saw we were in trouble and it seemed as though we had only a few minutes to live, I prayed and tried to stay calm" (Hattingh, 1997; Savides, 1997).

On the basis of the scenarios described above, and the unique factors that were pointed out, it can justifiably be said that firefighters

- are exposed to physical suffering, illness and death on a regular basis,
- are exposed to neurotic, psychotic and hostile persons during traumatic events,
- associate with human need and distress of victims, and

- take responsibility for the lives of others.

Firefighters also experience trauma on a daily basis. This can be vicarious trauma, caused by exposure to serious injury or death or personal trauma experienced in the execution of their duties. It is generally accepted that firefighters become hardy due to exposure to trauma, but certain scenarios are still difficult for them to cope with because of their unexpected, extraordinary nature. Firefighters are also confronted with perilous scenarios, where they must not only protect themselves and their colleagues, but must place their own lives at risk to rescue people.

Firefighters are exposed to the death of their colleagues much more frequently than people in other occupations. The families of firefighters are traumatised and experience tremendous stress. Firefighters experience exceptional strong stress reactions due to the scenarios they are subjected to. Firefighters also experience multiple stressors.

Against the background of the unique work context of firefighters, a general discussion of the job descriptions of firefighters will be presented in section 2.2 to further demonstrate this uniqueness. The specific tasks and functions of the different post levels will be indicated.

## **2.2 A JOB ANALYSIS FOR FIREFIGHTERS**

A job analysis for firefighters will promote a better understanding of the uniqueness of the tasks and functions of firefighters. The focus will be on firefighter's job descriptions and specifications as formulated by the Industrial Council for Local Government Undertakings (2000). The following profiles will be discussed, namely: *Learner Firefighter Gr 1 - 11/Junior-/Senior Firefighter; Leading Firefighter, Station Officer and Divisional Officer*

### **2.2.1 Learner Firefighter Gr 1 - 11/Junior-/Senior Firefighter**

The description of the most important duties of the Learner Firefighter Gr 1 - 11/Junior-/Senior Firefighter, in their order of importance, are:

- The operational duties consist of firefighting.
- Rescue operations consist of vehicle rescue, collapse rescue, trench rescue, confined space rescue, water rescue, high-angle rescue and emergency medical services. Special services are, for example, the removal of flood water, the prevention of flood damage, the rescue of animals, recovering of bodies, and recovering vehicles trapped by floods. Responding incidents involving hazardous materials is also a function of rescue operations.
- Communication services entail control room activities and site communication.
- Maintenance functions consist of the maintenance of vehicles, equipment and buildings. Personal maintenance refers to skills training and physical training.
- Administrative functions refers to the completion of source documents, the issuing of receipts and assistance with the compilation of statistics.
- Public relations and education entail the holding of public demonstrations, assistance with open days and the supply of information to visiting groups.
- The transportation of documents, food and personnel, the securing of the station perimeter, locking up of offices, switching off lights and air-conditioners, raising and

lowering flags and relieving control room attendants are among the relief and out-duty functions.

The profile of the Leading firefighter will now be discussed. A better understanding of the uniqueness of the tasks and functions of the Leading firefighter will be obtained.

### **2.2.2 Leading Firefighter**

The most important duties of the Leading Firefighter in order of importance will now be discussed. The duties are basically the same as those of the Learner Firefighter Gr1 - 11/Junior-/Senior Firefighter with the following additional duties:

- The operational and medical stores duties consist of taking stock, checking inventories, completing order sheets and checking fuel levels and orders.
- The additional tasks include the control of the platoon, relieving the station officer if needed, taking functional control of the platoon at incidents, giving directions and support in the control room if needed, and completing source documents such as fire reports. The training and development of firefighters and the determination of tasks at platoon level, subject to station tasks, are also regarded as additional tasks. Supervising and leading in the execution of tasks, the compilation of statistics, ensuring the safety of firefighters, the evaluation of firefighters and the maintenance of discipline conclude the additional tasks.

The profile of the Station Officer will now be discussed. A better understanding of the uniqueness of the tasks and functions of the Station Officer will be obtained.



### 2.2.3 Station Officer

The Station Officer is responsible for the application and enforcement of national, provincial and local legislation in order to safeguard the lives and property of the community and the evaluation of building plans, on-site inspection and administration connected therewith. The Station Officer also determines the causes of fires and conducts normal operational duties as and when required, and educates the public in fire preventing and safety measures. The most important duties of the Station Officer in order of importance are the following:

- The prevention of fire at new proposed buildings entails the evaluation of submitted plans, the interpretation and application of National Building Regulations and any other legislation pertaining to fire prevention, meeting with and providing advice to architects, designers and building owners, setting fire-prevention requirements, the evaluation of rational and engineered designs with regard to accuracy, technical correctness, interpretation and calculations, on-site inspections and progress reports; final inspection for the purpose of issuing an occupancy certificate in terms of national building regulations, and relevant administration and law enforcement.
- The prevention of fire at existing buildings entails the carrying out of scheduled inspections, the setting of requirements for fire protection and good housekeeping, meeting with and providing advice to building owners and occupants, assisting with the compilation of emergency plans, training on-site emergency teams and personnel in the use of first aid fire-fighting equipment, and relevant administration and law enforcement.

- The interpretation and application of legislation including SABS codes of practice, refer to the Station Officer's role as law enforcement officer regarding legislation directly related to fire services, the interpretation of the relevant law and codes of practice during consultation with building owners, designers and developers for the purpose of preventing fires, providing expert witness testimony regarding fire-related matters at all levels of the court system of the country, acting as Commissioner of Oaths, and relevant administration and law enforcement as prescribed by law.
- The control of premises and situations presenting major hazards namely: Major Hazard Installations (Ref. Occupational Health and Safety Act), Fire Works (Ref. Explosives Act), Chemicals sites (Ref. Fire Brigade Services Act and relevant SABS codes of practice), and Flammable liquids (Ref. Flammable Liquids By-laws). General tasks include responding to all public complaints, conducting trade licence inspections and setting requirements, conducting final inspections at sites for which trade licences were applied for, doing relevant administration, training and law enforcement.
- Operational duties entail the carrying out of operational duties when required, as for operational personnel at the same level, and to form part of the incident command system, supplying information and performing other functions on the scene or at the operations centre, and acting as safety officer on incident sites.
- Fire cause determination consist of the following functions: doing fire investigations at the site of any fire that had led to injury or death, damage of more than R50 000-00, or any incident where this procedure is deemed necessary by the operational officer, taking samples for forensic testing on the scene, interviewing all parties involved in the incident, taking photos for evidence, consulting with and supplying information to all

agencies involved, including the SAPD, insurance companies, etc., testifying in court, relevant law enforcement and administration.

The profile of the Divisional Officer will now be discussed. A better understanding of the uniqueness of the tasks and functions of the Divisional Officer will be obtained.

#### **2.2.4 Divisional Officer**

The Divisional Officer is in command of an Operational Division, responsible for fire, rescue emergency medical services and hazardous materials response. The most important duties of the Divisional Officer in order of importance are the following:

- Planning consists of the following activities: setting up standard operating procedures, compilation of a budget, determination of training requirements and determination of needs at station level.
- Organising consist of the following activities: organising firefighters to deal with various situations, organising the use of vehicles, and organising tasks to reach objectives.
- Leadership consist of the following activities: command and control, leadership in operational projects and priorities, forming part of the incident command system, delegation of tasks, coordination of shift activities and addressing problems of firefighters.

- Control consist of the following activities: responsibility for actions of firefighters, checking of reports pertaining to accidents, calls attended, equipment, etc. for correctness and timeous completion, and complying with the requirements of the Occupational Health and Safety Act.
- Accident reports and investigations involve ensuring that reports on accidents in the area are completed correctly within the specified time, and assisting the Senior Duty Officer with investigations into the causes of accidents.
- Meeting with the Senior Duty Officer to plan the coordinated responses to incidents, unrest response, and in-service training of firefighters.

## **SUMMARY**

There are common task characteristics between the profiles of the Learner Firefighter Gr 1 - 11/Junior-/Senior Firefighter, Leading Firefighter and Station Officer namely operational duties, rescue operations, communication services, maintenance and administrative functions, public relations, education, and relief and out-duty functions. Additional task characteristics of the Leading Firefighter include operational and medical stores duties and control of the platoon. The Station Officer is also responsible for the application and enforcement of national, provincial and local legislation in order to safeguard the lives and property of the community and the evaluation of building plans, on-site inspection and administration connected therewith. The Divisional Officer is responsible for fire, rescue emergency medical services and hazardous materials response. The quantitative results of the task characteristics (refer to Table 5.6) indicates the extent

to which it is considered as job stress factors.

The job specifications for the above-mentioned profiles can be categorised into psychological and physical attributes. The psychological attributes required are the ability to withstand stress, ego strength, interpersonal skills, urgent decision making and the ability to work at heights and in confined spaces. The physical attributes required are physical strength, high fitness levels and endurance. The presumption can be made that the Learner Firefighter Gr 1 - 11/Junior-/Senior Firefighter may experience more stress than for example the Leading Firefighter. The Learner Firefighter Gr 1 - 11/Junior-/Senior Firefighters may be fairly new in the service. These firefighters may be exposed to traumatic incidents which they have not yet experienced. This may cause more stress for them as for other firefighters which are longer in the service.

A discussion of stress in general will be presented in section 2.3.

### **2.3 STRESS DEFINED**

All living organisms experience stress. Stress is perceived by individuals in the context of their own experience. Humans are exposed to stress at home, at school, and at their jobs. It is a product of being alive. The term stress refer to a pressure or demand that is placed on an organism to adapt or adust (Nevid et al, 2005).Wingate (1972) sees stress as any influence which disturbs the equilibrium of the body, and includes within its reference physical injury, exposure, deprivation, all kinds of disease and emotional disturbance. Stress is a physical or psychological force, applied to a system, sufficient to cause strain or distortion in the system, or, when very great, to alter it into a new form (English & English, 1974; Gmelch & Chan, 1994; Jones & Bright, 2001). In essence, stress is any event that places a demand on the body, mentally or physically.

For the purpose of this study, stress will be discussed by *firstly* differentiating between stressors, stress and strain, *secondly by* differentiating between types of psychological stressors and, *thirdly* by focussing on the effect of stressor type on the duration and nature of strain.

### 2.3.1 Differentiating between stressor, stress and strain

Khan, Wolfe, Quinn, Snoek, and Rosenthal (1964) initially proposed a conceptual distinction between the terms stressor, stress and strain, which although followed by some researchers, has been ignored by most. Indeed, although vast numbers of people seem to suffer from daily or chronic stressors, there is confusion as to what exactly stress is (Barling, 1990). This confusion is described in numerous sources. For example, if we were to ask 100 people what they understand by the term ‘stress’, we would probably get 100 different answers (Hepburn et al, 1997).

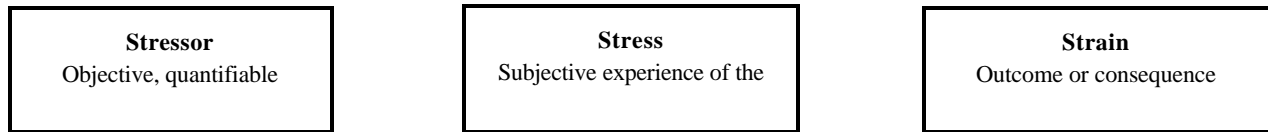
Any attempt to refine the concept of ‘stress’ must also consider the terms ‘stressor’ and ‘strain’, as considerable confusion is evident in how these terms are used. Within the widely cited framework provided by Khan et al. (1964), stressors are defined as objective environmental characteristics or events. These events are quantifiable and their occurrence can be objectively verified (Hepburn et al, 1997). Stress refers to the subjective interpretation or experience of stressors. The distinction between stressors and stress is crucial, because not all the individuals

#### **Coping resources**

Primarily personality hardiness,  
but including social support

#### **Coping resources**

Both personality hardiness and  
social support



**Figure 2.1: Framework for linking stressors, stress and strain** (Barling, 1990; Hepburn et al, 1997).

who experience the same event will perceive it in a similar manner. Finally, strain refers to the individual's affective, behavioural, or physiological response to his or her subjective experience of stressors. In other words, strain is the result of negatively perceived stressors or stress, and is the last stage in the total stress process (Barling, 1990). According to Figure 2.1, stressors can be described in the context of firefighters as "...events (that) are verifiable independently of the firefighters' consciousness and experience", stress as environmental properties "... as they are experienced by the firefighter and represented in his consciousness" and strain as "... firefighters' maladjustive psychological response to stress"(Hepburn et al, 1997).

Stress will now be further analysed in terms of a differentiation between types of psychological stressors.

### **2.3.2 Differentiating between types of psychological stressors**

It is important to differentiate between various types of stressors, because different types of stressors may result in different outcomes and may require different coping strategies, and the duration of strain may depend on the nature of the initial stressor (Barling, 1990). Three types of stressors are discussed in the relevant literature: chronic, acute and daily

stressors. It is suggested that these different stressors can be identified on the basis of three orthogonal dimensions: the duration of the stressor, the onset of the stressor, and its likelihood of recurrence (Kelloway & Barling, 1999).

As shown in Table 2.1, chronic stressors persist for a long time, are highly repetitive, and it is usually difficult to specify the exact time of their onset. Frequently cited examples of chronic stressors for firefighters, include intra-role stressors (i.e. role conflict, role ambiguity, and role underload and overload) and inter-role stressors (i.e. conflict between work and family), job insecurity, noise, climate, temperature, ventilation, humidity, lack of control (e.g. a traumatic incident), or having a terminally ill child or spouse (Barling, 1997). Daily stressors have a specific time of onset, are short-term (by definition, they endure no longer than a single day), and occur infrequently. Although daily events or stressors may well recur in the future, they do not occur repeatedly day after day. (If the same stressor did occur day after day, it would be classified as a chronic stressor) (Kelloway & Barling, 1999).

**Table 2.1: Differentiating between daily, acute and chronic stressors** (Barling, 1990; Volpe, 2000).

<b>Table 2.1</b>			
<i>Differentiating between daily, acute and chronic stressors</i>			
Type of stressor	Duration of stressor	Specific time onset of stressor	Likelihood of recurrence of stressor
Daily stressor	Short term	Yes	High
Acute stressor	Short term	Yes	Low
Chronic stressor	Long term	No	High

It can be interpreted that daily stressors for firefighters may for example include criticism for poor job performance or tardiness, conflict with peers or supervisors, experiencing



difficulties with a patient or victim, losing or misplacing things at work or home, or an argument with one's spouse or children (Kelloway & Barling, 1999). Acute stressors also have a specific time of onset, and are of short-term duration (but could endure longer than a day). Unlike daily stressors, however, acute stressors occur extremely infrequently and have a low likelihood of recurrence (Volpe, 2000). It can be interpreted that acute stressors for firefighters may for example include involvement in a rescue operation of a child in a mine shaft, a shooting, being fired or laid off, a job change or workplace disasters. The death of a close colleague would also constitute an acute stressor (Barling, 1997).

Stress will now be further analysed in terms of the effect of stressor type on the duration and nature of strain.

### **2.3.3. The effect of stressor type on the duration and nature of strain**

The independent research programmes conducted by Stone and Neale at New York State, and Lazarus and Folkman in California, provide a clear indication of the timing and duration of the consequences of daily, acute and chronic stressors. It is noted that "Some days everything goes wrong, and by day's end, minor difficulties find their outlet in rotten moods". It can be interpreted that this type of stressor would for example be experienced by a firefighter who had to deal with the death of a child during a rescue operation. Feelings of helplessness and guilt experienced by the firefighter might spill over to his family (Kelloway & Barling, 1999). However, two exceptions to this pattern should be noted. When the outcome of strain takes the form of physical symptoms rather than mood changes, same-day effects do not emerge. Rather, longitudinal data showed that daily stressors increased *three days* prior to the onset of the physical symptoms (e.g. upper respiratory tract infections). The process operative here can still be interpreted as one in which daily stressors exert an immediate effect. Specifically, the lagged relationship between daily

stressors and symptoms emerges because there is an immediate effect on the secretory immune system in general, and more specifically on secretory IgA (Barling, 1990).

It then takes some time (three days) for this immune dysfunction to translate into an upper respiratory tract infection. With regard to the duration of the strain, it appears that most of the effects of daily stress dissipate on the same day. Occasionally, however, mood effects carry over to the following day. If studies that focus on acute stressors are examined, a different pattern emerges regarding the duration of strain. It can be interpreted that responses of firefighters who had been involved in the rescue of people following a train disaster indicate that an experience of this nature represents an acute stressor for firefighters (Barling, 1990). It is of short-term duration and has a specific time onset, but unlike a daily stressor, it is of extremely low frequency and has a low likelihood or recurrence. Interviews with these firefighters revealed that the effect of the acute stressor was evident immediately, and that most of the strain associated with the stressor had dissipated within a week of the event (Kelloway & Barling, 1999).

According to Barling (1990), in some situations, acute stressors may exert long-term effects. It can be interpreted that the involvement in a short-term strike (i.e. three weeks) by firefighters represented an acute stressor. However, negative psychological functioning (but not marital functioning) was still evident six months after the end of the strike, which is *not* typical of an acute stressor. What transpired was that the firefighters were legislated back to work without a new contract, and the initial conflict endured for months. Most firefighters facing a potential strike do not believe it will last a long time, and do not make any financial plans to cope with a dramatic drop in family income (Barling, 1990). When strikes do last a long time, therefore, chronic financial stress results. Thus the guiding principle is that the strain will endure as long as the *stress* itself. In other words, the strain will endure as long as there is any concern that the effects of the stressor are still present,

or that a recurrence of the stressor is possible. Of course, the timing and severity of the strain will also depend on the effectiveness of different coping strategies the firefighters may choose to mobilise and utilise (Kelloway & Barling, 1999).

## **SUMMARY**

Stress can be summarised as ‘a physical, chemical or emotional factor that causes bodily or mental tension resulting from factors that tend to alter an existing equilibrium’. From the moment firefighters are born to the second before they die, their bodies and minds react to surrounding stimulus and change in some way to adapt. Stress takes firefighters out of their ‘comfort zone’ and forces them to change and adapt (Volpe, 2000).

Although the concept ‘stress’ usually has a negative connotation, some degree of stress is probably healthy, it helps keep firefighters active and alert. In fact, without some stress, firefighters would not be challenged to develop intellectually, emotionally or physically (Nevid, Rathus & Greene, 2005). Stress that is not managed can have a serious negative impact on firefighters physical and psychological well-being, such as complaints of fatigue and headaches and states of anxiety or depression (Eysenck, 1991). Stress is anxiety produced when events and responsibilities exceed firefighters coping abilities. Conversely, stress is the response of the body to any demand placed upon it to adapt, in other words stress is simply a single, nonspecific reaction of the body to a demand made upon it (Volpe, 2000).

Causes of stress are known as stressors. A large variety of physical and emotional stimuli cause stress. From major life events, such as divorce or the purchase of a new home, to minor things, such as being stuck in traffic, stressors affect firefighters in different ways (Jones & Bright, 2001). Firefighters genetic make-up, diet and coping strategies are just a

few controlling factors. The term stress should be distinguished from distress, which refers to a state of physical or mental pain or suffering. Also, the amount of time we subject ourselves to certain stressors is a critical factor. With this in mind, stress can be classified as either acute or chronic (Nevid, Rathus & Greene, 2005).

Acute stress is temporary stress that creates peak performance. Law enforcement officers reacting to an armed robbery-in-progress and high-risk emergency driving are examples of acute stress (Anshel, 2000; Garcia, Nesbary & Gu, 2004). Acute stress can be good in small amounts. It keeps firefighters alert, challenged and assured that all their systems are responding. It can actually improve the performance of firefighters as it takes them out of their 'comfort zone' and forces them to adapt to the new stimulus. The detrimental effects of stress are of no great concern if the stressors are temporary, as they are in the acute stress mode (Alexander & Klein, 2001; Herron, 2001).

Chronically stress, on the other hand, can have a critical impact on the ability to make competent, principle-based decisions. In this mode, firefighters bodies are in a 'continuous state of siege'. A serious terrorist attack, or trauma over a long period of time may cause chronic stress reactions in firefighters (Lemanski & Samuels, 2003; North, Tivis, McMillen & Pfefferbaum, 2002). One problem with chronic stress is that firefighters tend to adapt to it. While battling chronic stress, strong firefighters will compensate, both physically and mentally, for such a long time their mind and body may actually become comfortable. If not managed properly, chronic stress will have a detrimental physical and psychological effect on firefighters (Shakespeare-Finch, Smith & Obst, 2002; Vogel, Cohen, Habib & Massey, 2004).

For the purpose of this study, stress is conceptualised in terms of the diathesis-stress model that posits that abnormal behaviour problems involve the interaction of a vulnerability or

predisposition and stressful life events or experiences (Nevid, Rathus & Greene, 2003).

A specific definition of job stress amongst firefighters will be presented in section 2.4.

## 2.4 JOB STRESS DEFINED

Job stress will be defined by focussing *firstly* on the physical reactions to job stress, then *secondly* on the nature of job stress, and *thirdly* on the description of job stress amongst firefighters.

### 2.4.1 Physical reactions of job stress

The human body and all its function are controlled by two parts of the central nervous system. One part, the parasympathetic nervous system, controls the voluntary, conscious aspects of bodily functioning: moving limbs, speaking words, reading, singing, dancing, etc. The other component, the sympathetic nervous system, controls all of the nonvoluntary, unconscious bodily functions such as heart rate, respiration, blood-vessel dilation, hormonal secretion, digestion, etc (Volpe, 2000). This latter system is considered very primitive, dating back to a time when we were still running through the jungles and swinging from tree to tree. It is that part of the brain that we have in common with monkeys, apes, dogs, etc. It is an internal mechanism that keeps our bodies functioning at the correct revolution per minute for whatever task we need to perform. It is the system that promotes the **fight or flight response** (Nevid et al, 2005; Lewis, 1994).

For thousands of years, this part of our central nervous system was extremely important and well-utilized as humans found themselves in situations that required that they either fight or flee. This part of the central nervous system would *kick in* automatically with very little

conscious thought (Nevid et al, 2005). Since it operates primarily in response to sensory stimulation, which is connected to the most primitive part of the brain, all it would take is the sight of an enemy or the smell of a large dangerous animal, and the individual's body instinctively would downshift into overdrive. Likewise, this system also has a braking mechanism in order to slow down the process (Lewis, 1994).

Since the human species has become more *civilized* and domesticated, we are no longer in many situations that allow the expression of the **fight of flight response**. However, because it is nonvoluntary, unconscious, and connected to the primitive part of the brain, the sympathetic nervous system is still functional. We now find ourselves in situations where we have to suppress the response because to allow its expression might result in severe repercussions (Volpe, 2000). Nevertheless, the internal unconscious adjustments and changes continue even though the external action is suppressed. One might say that it is the equivalent to putting your car in drive and depressing the accelerator while keeping on the emergency brake. All of the previously mentioned functions continue: heart rate, respiration, digestion, hormonal secretion, perspiration, neurotransmitter production, et cetera (Nevid et al, 2005).

The function of the fight or flight response as a firefighter prepares to protect itself results in the following physiological reactions or symptoms:

- Adrenalin gets pumped into the blood system along with a higher level of blood glucose. This acts as a *supercharger* or *turbo boost* to the entire physiological system (Nevid et al, 2005).
- The stomach secretes more digestive juices in order to process any remaining food and transform it into needed energy/fuel (Lewis, 1994). As part of this process, the

firefighter's excretory functions increase in order to rid itself of *excess baggage* that may slow it down (Nevid et al, 2005).

- The heart and lungs start to increase their functioning. Breathing becomes shallow and rapid, while the heart pumps blood at a more rapid rate (Nevid et al, 2005).
- Peripheral blood vessels constrict and blood is directed away from the extremities (hands, arms, legs, feet) and into the internal organs (Lewis, 1994). Once again, in the case of a fight, this is an appropriate response because it limits the bleeding that may be caused by cuts to the limbs. It also lessens the pain from such contact because a numbness and coldness develops as a result of constricted blood supply (Nevid et al, 2005).
- The firefighter begins to sweat and secrete bodily fluids, which make it slippery and difficult to grasp. Colloquially, we tend to use these two terms interchangeably; however, they are actually the opposite of one another. When one is concentrating, there is a sense of being focused on one stimulus: absorbed by one task (Lewis, 1994). There is a limited awareness of extraneous stimuli that may distract from one's concentration. Attention is a state of hypervigilance: an increase in the sensitivity of the *radar system*. The firefighter quickly picks up movements, sounds, smells, etc The ability to focus on one stimulus is diminished because the firefighter is attending to a variety of potential warning signals (Nevid et al, 2005).
- Muscle tone is enhanced; there is a muscle tension and a heightened state of arousal. The firefighter is poised for action (Lewis, 1994; Nevid et al, 2005).

The above-mentioned takes place concurrently in a matter of a moment in the form of a

reflexive unconscious response. It is also what happens for firefighters on a regular basis day in and day out. These are also the symptoms of an anxiety attack (see Table 2.2). The preceding symptoms are what lead to ulcers, hypertension, headaches, muscle tension, fatigue and a variety of other job-stress-related illnesses.

**Table 2.2: Symptoms of the fight or flight response** (Lewis, 1994; Nevid et al, 2005).

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**Table 2.2**

*Symptoms of the fight or flight response*

---

- Increased heart rate
  - Hyperventilation or shortness of breath
  - Upset stomach
  - Increased perspiration
  - Feeling numb or cold in the fingers/hands
  - Feeling muscle tension, “uptight”
  - Difficulty concentrating
- 

The above-mentioned symptoms of the fight or flight response may manifest in the short-term amongst firefighters. The fight or flight response may manifest as more serious reactions and symptoms in the long-term. These reactions and symptoms will be discussed in more detail in section 2.7.

The nature of job stress amongst firefighters will be explored in the following section.

#### **2.4.2 The nature of job stress**

Firefighters tends to associate job stress with anxiety, frustration, tension, pressure, and



pain. Therefore most firefighters regard job stress as negative. Job stress can be classified into three categories, namely *negative job stress*, *neutral job stress* and *positive job stress*. These categories can be described as follows:

#### **2.4.2.1 Negative job stress**

Negative job stress amongst firefighters, also known as distress, is characterised by anxiety, tension, trouble, frustration, fear, pain, exhaustion, unhappiness, confusion, trauma, etc. (Nevid et al, 2005; Volpe, 2000).

#### **2.4.2.2 Neutral job stress**

Neutral job stress amongst firefighters, is characterised by change, conflict, noise, financial concerns, ineffective communication, discomfort, expectations, people, the unsuspected, etc (Volpe, 2000). This category represents words, attitudes and behaviour although they initially evoke negative feelings, may lead to positive experiences if they are handled correctly and viewed in the right perspective (Nevid et al, 2005).

#### **2.4.2.3 Positive job stress**

Positive job stress amongst firefighters, also known as eustress, is characterised by opportunities, challenges, progress, promotion, excitement, creativity, stimulation, etc.(Nevid et al, 2005; Volpe, 2000).

A description of job stress amongst firefighters will be presented in section 2.4.3

### **2.4.3 Description of job stress**

Job stress is the body's response to a particular stimulus. Job stress can thus be described as the way firefighters experience and cope with job stressors. Job stress is thus not the actual experience, but the firefighter's reaction to the experience. Job stress is a systemic or physical syndrome which follows certain patterns and influences specific organs (Volpe, 2000).

The Psychology Dictionary (Plug, Meyer, Louw & Gouws, 1991) defines job stress as the total of the physical and psychological reactions to harmful and/or uncomfortable stimuli (including external environmental stimuli such as noise and danger, as well as internal stimuli such as chronic anxiety, intense emotions, worries and tension). Job stress is generally characterised by the disturbance of the homeostasis of the body, and more specific by phenomena such as palpitation of the heart, continuous tiredness, anxiety, tension and restlessness.

Job stress is the physical and psychological response of a firefighter to pressure. It must be further noted that not all job stress is negative. The stimulus can even serve as a motivator. Without job stress change will not take place and there will be no challenges. Job stress can therefore be positive. It becomes negative when it continues too long and the person lacks skills needed to cope with the situation (Nevid et al, 2005).

Job stress can be caused by any situation that strains the normal coping skills of a firefighter. A potentially stressful situation causes a physical response if the firefighter perceives it as harmful or dangerous since job stress responses are caused by a firefighter's perception and interpretation of a situation (Volpe, 2000). The same situation will thus be experienced differently by different firefighters. There is a clear difference between growth-facilitating stress (challenges) and growth-inhibiting stress (harmful threats) (Dewe, Leiter & Cox, 2000).

Job stress is caused by the internal forces that resist external threats (stimuli). The reactions of the body can be connected to subjective experiences and social and psychological events. Job stress is thus the interactive forces between physical experiences and the external environment (Volpe, 2000). The more modern approach in relevant literature conceptualises job stress as a system or process consisting of a stimulus, a perception, recognition and evaluation of the stressor, a response or reaction to the stressor, and the effect of the response on the stressor (Nevid et al, 2005).

Job stress cannot be discussed without referring to coping with job stress. If a situation is perceived as stressful because of the stimulus that characterises that situation, a specific response may be evoked in some firefighters. It will, however, not evoke the same response in all firefighters (Van Zyl, 1991). According to Herrick (1992), firefighters can cope with job stress to a certain degree. There are no correct or wrong ways of coping with job stress, and firefighters have different levels of job stress tolerance and unique coping skills. It is necessary to seek assistance when coping skills fail.

Conclusions regarding job stress are regularly made on the basis of firefighters responses, thus both the short-term and long-term causes of available coping strategies and firefighters use of these strategies are related to job stress (Volpe, 2000). The recognition of coping strategies emphasize the complexity of the individual factor of firefighters. The degree to which a situation is experienced as stressful will depend on a complex interaction of factors, which will include genetic predisposition, previous social experiences, cultural factors and a lifelong conditioning process (Nevid et al, 2005).

The effect of job stress will be more moderate when the firefighter has access to appropriate coping strategies. According to Fishkin (1991a), the nature of job stress at the most basic level is psychological and a direct result of the manner in which a firefighter was

taught to cope with job stress. He further states that the efficiency of a firefighter in the work environment and everyday life is determined by the manner in which the firefighter was taught to cope with tension on both the conscious and unconscious levels.

## **SUMMARY**

Job stress was analysed in terms of three aspects. The *first* aspect was the stress-related changes in the body of firefighters associated with the fight-or-flight reaction. Corticosteroids, epinephrine and norepinephrine are released. The heart rate, respiration rate and blood pressure increase. Muscles tense and blood shifts from the internal organs to the skeletal muscles (Nevid et al, 2005). Digestion is inhibited, sugar is released by the liver and blood-clotting ability is increased. Stress triggers the alarm reaction. The reaction is defined by secretion of corticosteroids, catecholamines, and activity of the sympathetic branch of the autonomic nervous system. The alarm reaction mobilises the body for combat or flight. Psychologically, firefighters focus on specific problems better and think more clearly because there is an increase of blood and oxygen to the brain (Volpe, 2000). It can be interpreted that firefighters which are constantly mobilised for combat or flight may have excess chemicals in their bodies. This may cause that firefighters feel tense and exhausted.

The *second* aspect focussed on the nature of job stress, where it was indicated that firefighters most frequently experience negative job stress because of the nature of their task characteristics. The quantitative results in Table 5.7 confirm this conclusion. It is therefore important to investigate the causes of this negative job stress and its effect on their family life. However, firefighters also experience a limited degree of neutral job stress and positive job stress. The ideal situation will be to transform the negative job stress into neutral job stress and positive job stress (Nevid et al, 2005).

The *third* aspect emphasised that job stress experienced by firefighters was an energy-absorbent, negative emotional experience, which normally follows once a stimulus has been interpreted on either a conscious or an unconscious level as a threat, and leads to a response to terminate the experience. The experience of job stress can normally be linked to an emotion (Jerling, 2002). Van Zyl (1991) identified the following job stress emotions: anger, guilt, dissatisfaction, agitation, depression, fear, helplessness, loneliness and sadness. All the aforementioned emotions can be linked to job stress. These emotions may lead to certain behavioural problems (Pike, 2003).

While stress is a factor in every job, firefighters, law enforcement officials, ambulance drivers, correctional officers and military populations must handle an above-average level of stress (Kinchin, 2000; Waters, 2002). They get forced out of their ‘comfort zone’ unpredictably and, many times, over an extended period of time (Harpold & Feemster, 2002). It is therefore important to emphasise that firefighters might experience job stress due to the nature of their working conditions. Furthermore, firefighters might experience job stress on a physical and psychological level and they might cope differently with job stress due to the subjective nature of the experience (MacDonald, 2003; Wells, 2003).

A model of job stress will be presented in section 2.5.

## **2.5 A MODEL OF JOB STRESS**

### **2.5.1 Introduction**

In recent years, occupational health research has advanced beyond an exclusive focus on physical hazards in the workplace to broader conceptions of health that embrace psychosocial dimensions of work: “*the social environment at work, organisational aspects of*

*the job and certain operational aspects of the task performed*' (Sauter, Murphy & Hurrell, 1990).

Occupational stress researchers from the United States and Europe (especially Sweden) have examined how specific characteristic of jobs affect mental health (for example, depression, anxiety and general mental distress symptoms) and physical outcomes, such as heart disease, ulcers and chronic pain (Piltch, Walsh, Mangione & Jennings, 1994).

Increasingly, such research has focused on two resources-social support and job control-as potential moderators of the effect of work-related demands and pressures on the mental and physical health of firefighters. Social support for work includes help that firefighters receive from supervisors, co-workers, spouses, friends and relatives. Control, in general, is the ability to exert some influence over one's environment so that the environment becomes more rewarding or less threatening. Job control is the ability to influence the planning and execution of work tasks. Unlike measures of personal control that focus on the firefighter's personality, job control focuses on how the organization of work may or may not provide the resources necessary for firefighters to meet the demands of work (Piltch et al, 1994).

A theoretical model that has been used increasingly to measure the effects of job content on firefighters health and well-being is the job strain model developed by Robert Karasek (1979) and colleagues in Sweden. The two-dimensional model locates the primary source of job stress within the task demands of the job itself. Jobs that simultaneously present heavy psychological demands and restrict the firefighter's options for responding to those demands (for example, jobs high in demands and low in decision latitude, or "control") are seen as potentially stressful (Piltch et al, 1994).

Decision latitude includes control over both the use of one's abilities (skill direction) and the way in which work is accomplished (skill authority). Psychological job demands include such factors as time pressure, deadline stress, heavy workloads and conflicting demands. Karasek's measures of job demands and control were originally derived from the United States Quality of Employment Survey administered in 1969, 1972 and 1977. In early analyses, the model was used to test the relationships between self-reported measures of job demands and control and mental strain (exhaustion and depression) in male workers in the United States and Sweden (Karasek, 1979). The United States data came from the 1972 and 1977 Quality of Employment Survey; the Swedish sample came from longitudinal national surveys of workers conducted in 1968 and 1974. The United States study showed a fourfold variation in *high-strain jobs* (the high demands and low control group) and those in *low-strain jobs* (high in control and low in demands). Furthermore, both the United States and Swedish samples showed a fourfold variation in exhaustion between the high-strain and low-strain workers (Piltch et al, 1994).

The job strain model classifies firefighters into quadrants on the basis of the level of control they experience. The model is interactive in that the impact of job demands is moderated by job control. High-strain jobs are expected to produce higher levels of mental and physical distress than low-strain jobs, *active jobs* (high demands and high control), or *passive jobs* (low in demand and low in control). The interactive model suggests two hypotheses, one each along the major and minor diagonals in the 2 x 2 table: (a) in both cells where demands are relatively greater than control, mental and physical distress will occur (Diagonal A), and (b) when demands and control are both high, active learning should result, whereas when they are both low, skills will atrophy (Diagonal B) (Karasek, 1979). The job stress model of Cox and McKay (Cox, 1978) will now be discussed against the background of the aforementioned introductory remarks.

## 2.5.2 Cox and McKay's job stress model

Van Zyl (1991) criticised various job stress models and concluded from the literature that he could not find any critique against the job stress model of Cox and McKay (Cox, 1978). The job stress model of Cox and McKay (Cox, 1978) as adapted for firefighters is presented in Figure 2.2 (see page 47). It is clear from the schematic presentation that emphasis is placed on the feedback provided by the different components in the model. Owing to the existence and importance of these feedback components, the system is described as cyclical

and not linear. There are *four* identifiable phases in the model namely:

### 2.5.2.1 Phase One

The first phase represents the demands placed upon the firefighter by the environment (Cox, 1978). External demands are factors outside the firefighter, and internal demands are the needs that determine the behaviour of the firefighter (Van Zyl, 1991).

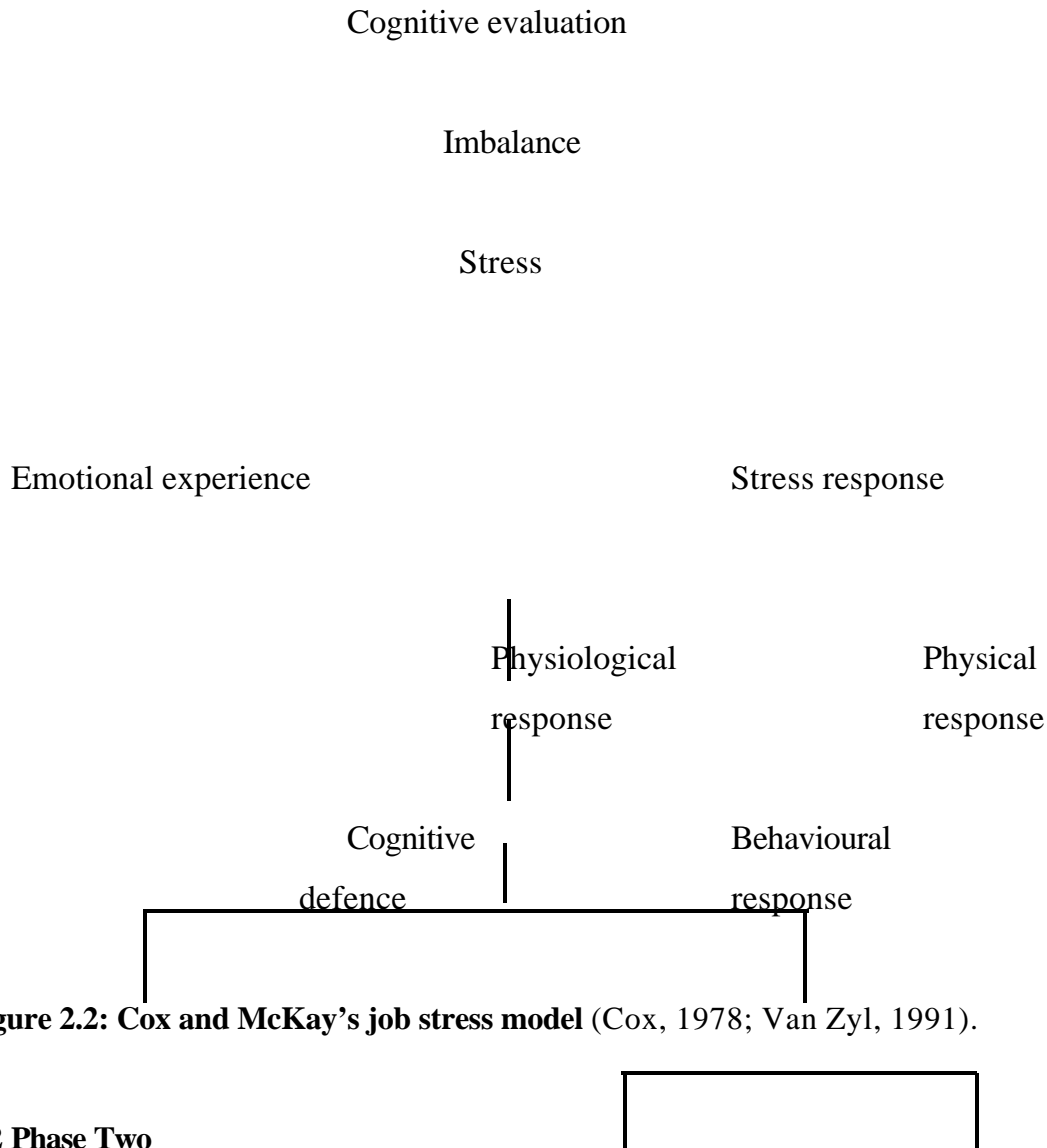
Actual ability

Actual demand

Perceived ability

Perceived demand





**Figure 2.2: Cox and McKay’s job stress model** (Cox, 1978; Van Zyl, 1991).

**2.5.2.2 Phase Two**

The second phase represents the firefighter who continuously observes these demands, and the ability of the firefighter (~~psychological make-up~~) to cope with these demands. According to Cox (1978), job stress occurs when there is an imbalance between the perceived demands and the ability of the firefighter to cope with these demands. Cox (1978) emphasises the importance of noting that the imbalance or balance between demands and capabilities should be generated as perceived by the firefighter, and not as it occurs in reality (Van Zyl, 1991).

The potentially stressful job situation as well as the firefighter's ability to cope with it, are continuously evaluated at a cognitive level. If, for example, the demands of a job situation are too high for a firefighter, but the firefighter has not yet cognitively evaluated it as such, job stress will not be experienced. Once the firefighter realise that the job demands cannot be met, job stress will be experienced (Van Zyl, 1991).

When a firefighter realises that job demands cannot be met, energy is required by the stimulus that will be interpreted as threatening. The term 'threat' means an emotional evaluation of a specific stimulus. The imbalance between demands and coping strategies will be experienced at an emotional level. Each specific negatively toned emotion possibly reflects a particular transaction between the firefighter and his or her environment. These factors should be accounted for in the firefighter's cognitive appraisal, which shapes basic feelings into a specific emotion (Van Zyl, 1991).

### **2.5.2.3 Phase Three**

The emotional experience of job stress may be accompanied by physical changes as well as cognitive and behavioural responses. This is executed in order to cope with the stressful nature of job demands (Cox, 1978). The physical changes and cognitive and behavioural responses occur in reaction to job stress and constitute the third phase of the model (Van Zyl, 1991).

The first step in the response to job stress is the decision of the one or another alternative to cope with the job stress. When the firefighter doubts the validity of his or her response to job stress, anxiety, panic and uncertainty may occur. Responses to job stress can be divided in two categories:-

- *Firstly*, specific behavioural responses can be indicated, namely direct-action tendencies, which attempt to minimise the external job demands. These can take the form of physical as well as symbolic “attacks”, aimed at the person responsible for the threat. Alternately responses could take the form of avoidance behaviour, passivity or other activities aimed at coping with the job demands (Van Zyl, 1991).
- *Secondly*, cognitive defence mechanisms are utilised. Examples of cognitive defence mechanisms are the re-evaluation of a firefighter’s needs, or the minimising of the order of importance of these needs. Job stress responses may also include physical responses such as the secretion of adrenalin, increased or decreased muscle contractions, etc. (Van Zyl, 1991).

#### **2.5.2.4 Phase Four**

The fourth phase of the job stress model is the effect of the response on the firefighter concerned (Cox, 1978). The effect can manifest at a physical level (for example: bodily exhaustion) and at a psychological level (for example, the development of feelings of inferiority) (Van Zyl, 1991).

An important characteristic of the job stress model is the feedback that takes place during certain phases of the model. This feedback process may influence the other phases. An ineffective response strategy may, for instance, increase the imbalance, which may cause functional and structural damage to the firefighter. The critique on Cox and McKay’s (Cox, 1978) job stress model will now be discussed (Van Zyl, 1991).

#### **2.5.3 Critique on Cox and McKay’s job stress model**

The literature study has produced actual negative critique against Cox and McKay's (Cox, 1978) job stress model. Job stress must be described as a dynamic process which includes both the physical and psychological characteristics of a firefighter. The interaction approach to job stress follows this principle. The more modern approach to job stress focuses on the important role that demands play, and the ability of firefighters to cope with such demands. The interaction approach to job stress concentrates on this aspect (Van Zyl, 1991).

Rather than view the specific configurations of the response patterns in isolation, more recent literature tend to emphasise the transactional approach to job stress. The interactional approach to job stress is that it is an individual phenomenon and a product of the interaction between the individual and the environment (Van Zyl, 1991).

The most important reasons for the use of Cox and McKay's (Cox, 1978) job stress model are as follows:

- The model forms part of the interaction approach to job stress, which has proved to be the most suitable approach to the study of job stress.
- In the discussion of the model reference is made to the interaction between the components of the model. The model thus has prediction value.
- The model is suitable for the purpose of the research conducted to assist firefighters to cope with job stress and family stress.
- Recent literature indicates that this job stress model is frequently used.

## SUMMARY

The significance of Cox and McKay's (Cox, 1978) job stress model for this study is that the model refers to demands or stressors which are linked to one or another stress response. The stress responses are divided in the physiological, physical, cognitive defence, and behavioural response components. It can be reason, that it seems necessary to empirically measure *stressors* and *stress reactions and symptoms*, to obtain a better understanding of job stress of firefighters. The stressors that will be measured are the causes arising outside the work situation, task characteristics, organisational functioning, physical working conditions and job equipment, career and social matters, and remuneration, fringe benefits and personnel policy (refer to the Experience of work and life circumstances questionnaire). The stress reactions and symptoms that will be measured are somatic symptoms, obsessive-compulsive behaviour, interpersonal sensitivity, depression, and anxiety (refer to the Stress questionnaire). The focus will be on the causes of stress (reactions and symptoms) and how it precipitate in intra-psychical and interpersonal outcomes.

Job stressors of firefighters will be presented in section 2.6.

## 2.6 JOB STRESSORS OF FIREFIGHTERS

The job stressors of firefighters will be described in the following order: the causes arising outside the work situation (section 2.6.1) and the causes originating within the work situation (section 2.6.2). The latter contains a number of subdivisions, which deals with the characteristics of the task(s) to be performed, the functioning of the organisation, physical working conditions and job equipment, career and social matters and remuneration, fringe benefits and personnel policy. The model of job stressors of firefighters is presented in Figure 2.3, on page 52 (Koortzen, 1996; Shakespeare-Finch, Smith & Obst, 2002; Waters,

2002).

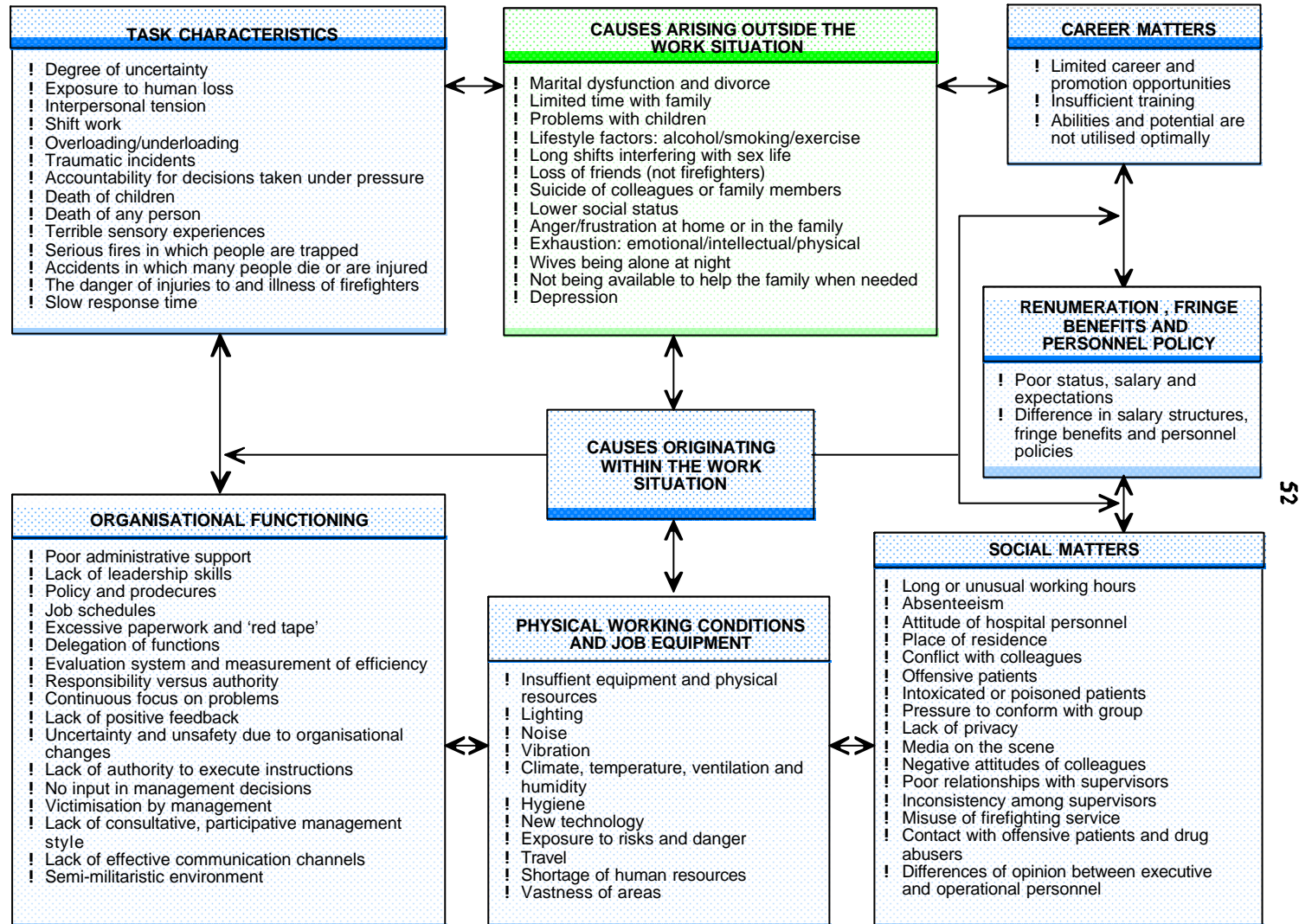


Figure 2.3: Model of job stressors of firefighters (Koortzen, 1996; Shakespeare-Finch *et al.*, 2002; Waters, 2002)

### **2.6.1 Causes arising outside the work situation**

Causes arising outside the work situation refer to marital dysfunction and divorce, limited time with family, problems with children, and lifestyle factors such as the abuse of alcohol, excessive smoking and lack of exercise (Roberts & Levenson, 2001). Further issues include the long shifts, which interfere with their sex lives, loss of friends (not firefighters), suicide of colleagues or family members, lower social status, anger and frustration at home or in the family, emotional, intellectual and physical exhaustion, wives being alone at night and not being available to help the family when needed (He, Zhao & Archbold, 2002; Shakespeare-Finch et al, 2002).

### **2.6.2 Causes originating within the work situation**

The task characteristics as a cause of stress originating within the work situation will now be discussed.

#### **2.6.2.1 Task characteristics**

The task characteristics will now be analysed in terms of the degree of uncertainty, exposure to human loss, interpersonal tension, shift work, overloading, underloading and traumatic incidents.

##### **(a) Degree of uncertainty**

Firefighters and law enforcement officers do not know in advance what each shift will require of them of and have little control over the unpredictability of their work (Stockton, 2003). The unpredictability of when the alarm will be sounded, and what it will mean, is



experienced as a stressor. Firefighters are therefore more vigilant which cause that they become faster exhausted than other people (Seedat, La Grange, Niehaus & Stein, 2003).

**(b) Exposure to human loss**

Firefighters witness how people are injured because of accidents or physical violence, or even die as a result thereof. The perception amongst firefighters might exist that they and other people are very vulnerable (Waters, 2002).

**(c) Interpersonal tension**

Poor communication, lack of teamwork and cooperation can cause tension amongst people, and such tension is greater amongst firefighters and police officers than among ordinary office personnel. Sutherland and Cooper (1990) regard interpersonal tension as a stressor because firefighters work with injured children, deal with dying patients, take responsibility for the work of others, work with people who are in pain, and must obtain information in an indirect manner (Wiese, Rothmann & Storm, 2003).

**(d) Shift work**

The biggest problem encountered with shift work is that it inhibits participation in family and social life. Shift work causes stress due to the fact that the shift worker is out of pace with the community. Job stress will be further increased for persons who rotate during shift work due to the continuous adaptation to new patterns. Early research conducted among shift workers indicated that they have a higher frequency of sleeping disturbances, moodiness, indigestion problems and social deviations than normal daytime workers (Fishkin, 1991a).

The negative effect of shift work on firefighters is currently one of the biggest problems for managements at fire stations. Because a 24-hour service is essential, night shifts are unavoidable. In a study conducted by Du Toit and Botes (1996), fifty four percent of ambulance drivers and thirty three percent of firefighters complained about the long working hours. They indicated that there s no time to spend with their families, or to participate in sports. The firefighters must cope with little sleep, which causes chronic fatigue, mood swings and aggression which in turn gives rise to interpersonal conflict and alcohol abuse.

Fishkin (1991a) states that 24-hour shift work contributes to the disintegration of the family, especially if the working schedule of the firefighter clashes with that of his partner. The fact that the firefighter's schedule differs from the family's schedule, and that he has to work on weekends and public holidays, causes additional conflict and stress in the family. The shift schedule of the firefighter causes irregular contact with friends and limit social activities. Social contact and leisure activities with his family and friends can for that very reason serve as a stress discharge facility.

#### **(e) Overloading and underloading**

Overloading has received attention as a stressor. Overloading may be quantitative (too much to do) or qualitative (too difficult) by nature. Quantitative overloading refers to, for example long working hours with insufficient rest. Qualitative overloading is caused for example by work that requires constant concentration and having to make important decisions instantly. Warshaw states that there is enough evidence that overloading can lead to a nervous breakdown. It may occur suddenly, or subtly and systematically (Sutherland & Cooper, 1990) .

Underloading may also cause problems. Boredom, insufficient stimulation and a lack of

opportunities to utilise acquired skills and competencies, and the repeatedly execution of apparently futile functions are examples of underloading. Repeatedly doing monotonous work may also, according to Sutherland and Cooper (1990), contribute to job stress reactions. Certain positions are so structured that the incumbents are subjected to both overloading and underloading. The job of the firefighter is such a job, for example, underloading will possibly lead to boredom, disinterest, perceptions of uselessness, guilt and 'ego' self-image problems.

**(f) Traumatic incidents**

Firefighters and police officers tend to perceive the whole world as being full of trauma, because they always deal with the traumatic side of life (Peltzer, 2001). This cognitive perception leads to the exaggerated generalisation that trauma is just as much part of their leisure activities as it is of their time at work (Aterburn, 2001). The continuous expectation of threatening trauma penetrates the interpersonal life of the firefighter and influences relationships with significant others. This often causes firefighters to be overprotective their families, which contributes to family stress (Lemanski & Samuels, 2003; Regehr, Johanis, Dimitropoulos, Bartram & Hope, 2003).

Further task characteristics that causes stress are accountability for decisions taken under pressure, death of people, terrible sensory experiences, serious fires in which people are trapped, accidents in which many people are injured, the danger of injuries to and illness of firefighters, and slow response time.

The organisational functioning as a cause of stress originating within the work situation will

now be discussed.

### **2.6.2.2 Organisational functioning**

The organisational functioning will now be analysed in terms of administrative stressors, uncertainty and unsafety.

#### **(a) Administrative stressors**

Administrative stressors include poor administrative support, lack of leadership skills, policy and procedures, job schedules, excessive paperwork and red tape, delegation of functions, evaluation system and measurement of effectivity, responsibility versus authority, continuous focus on problems, and a lack of positive feedback (Beaton, Murphy & Pike, 2001).

#### **(b) Uncertainty and unsafety**

Uncertainty and unsafety refers to continuous organisational changes, which may also affect the post structures. Sutherland and Cooper (1990) indicate the following organisational and management changes that affect job stress amongst firefighters namely: they have a lack of authority to execute instructions, they receive insufficient support from management, they have no input in management decisions, they have poor or insufficient supervision, they work with insufficient information, they receive insufficient recognition from supervisors, they do not know what is expected of them, their specific needs are generally ignored, they must do things with which they do not agree, colleagues do not work in the same way as you do, they are expected to discipline colleagues, and training is insufficient (Dietrich, 1993).

A study of firefighting services conducted by Du Toit and Botes (1996) at three cities in South Africa revealed the following organisational problems: lack of consultative, participative management style, older managers feel threatened by younger, better qualified and efficient personnel, the firefighters feel that they are victimised by management if they report grievances, a lack of regular meetings, ineffective vertical communication and feedback and, in some instances, an overload of information, bureaucracy and 'red tape'. This leads to unnecessary misunderstandings, a feeling of discomfort, especially among ambulance drivers, with regard to having to function in a semi-militaristic environment. All of these organisational problems can possibly lead to disempowerment, frustration, interpersonal conflict and dissatisfaction. Also lower motivation, loyalty and commitment (Jerling, 2002).

Further causes of stress in terms of organisational functioning are lack of authority to execute instructions, no input in management decisions, victimisation by management, lack of consultative, participative management style and effective communication channels, and the semi-militaristic environment.

The physical working conditions and job equipment as a cause of stress originating within the work situation will now be discussed.

### **2.6.2.3 Physical working conditions and job equipment**

This section will now be analysed in terms of insufficient equipment and resources, physical working conditions, lightning, noise, vibration, climate, temperature, ventilation, humidity, hygiene, new technology, exposure to risks and dangers, travel, shortage of human resources and vastness of areas.

**(a) Insufficient equipment and physical resources**

Having to work with insufficient equipment due to the economic climate in South Africa, may also cause job stress. Firefighters at a certain fire station on the East Rand indicated that they were afraid to respond to an emergency call using some of their ambulances, because some of the equipment was no longer in a working condition. Du Toit and Botes (1996) refer to a newspaper article in the Metro under the heading: “*Wrakke moet lewens red*”. In this article reference is made to the poor equipment with which firefighters must perform their duties. The article further indicates that ambulances in the Pretoria area are in a poor condition due to a lack of funds (ten ambulances broke down during the Easter period) and are very old (during the past four years no new ambulance were purchased) (Anonymous, 2003).

The slow response time may also be contributed, according to Du Toit and Botes (1996), to this fact. They further state that the assumption can be made that this problem with equipment is not confined to the Pretoria area only. Because of the high professional standards that firefighters set for themselves in the saving of lives, a situation such as the above-mentioned must obviously cause frustration (Anonymous, 2003). Insufficient and substandard equipment will therefore contribute to job stress amongst firefighters. According to Du Toit and Botes (1996), the members of the public often exaggerate a situation to speed up the arrival of an ambulance. The firefighter then places his own life at risk in his haste to reach the caller. Sometimes a firefighter is unable to find a place for a patient in a hospital, which contributes to job stress. This can also become humiliating and the firefighter can even feel guilty and ineffective (Anonymous, 2003).

**(b) Physical working conditions**

Physical working conditions can also serve as a job stressor. Research has been conducted to link the working conditions in a specific position to the physical and mental well-being of the incumbent (Sutherland & Cooper, 1990). Research findings have indicated that poor mental health can be linked to unpleasant working conditions, which include having to work very fast, the rendering of many physical outputs, and extreme working hours (Anonymous, 2003; Pike, 2003).

**(c) Lightning**

The firefighter is dependent on mobile lighting when working outside on the roads at night (Pike, 2003). The lighting may sometimes not be sufficient to ensure the efficiency of the work that must be done and the effectiveness of decisions that must be taken. This may also lead to disorientation (Seedat et al, 2003; Sutherland & Cooper, 1990).

**(d) Noise**

Firefighters are exposed to different kinds of noise caused, for instance, by burning buildings, droning traffic, people shouting or crying, and sirens blaring (Pike, 2003; Seedat et al, 2003). This together with other sensory experiences, represent strong and sometimes negative stimuli which firefighters is constantly bombarded with (Sutherland & Cooper, 1990).

**(e) Vibration**

The vibration of the machines with which firefighter's work, may have a negative effect on

them, for example, discomfort and pain (Pike, 2003; Sutherland & Cooper, 1990).

**(f) Climate, temperature, ventilation and humidity**

The conditions under which firefighters work can be very extreme. For example, working in a building on fire is extremely dangerous and stressful (Sutherland & Cooper, 1990). There is always the possibility that they can get hurt, injured or killed under these circumstances (Pike, 2003; Seedat et al, 2003).

**(g) Hygiene**

The firefighter is expected to work outside, in dirty conditions, in aqueous and sub-aqueous environments and is dependent on mobile units which contributes to unfavourable conditions (Pike, 2003; Seedat et al, 2003; Sutherland & Cooper, 1990).

**(h) New technology**

The introduction of new technology demands the acquisition of new skills, which could require considerable effort (Sutherland & Cooper, 1990). This is normally done in working hours and is often interrupted by emergency calls. This situation splits the attention of the firefighters (Pike, 2003; Seedat et al, 2003).

**(i) Exposure to risks and dangers**

Firefighters are almost always exposed to risks and dangers – when they are required to drive at high speeds, when the drivers of vehicles that they have to pass ignore the safety of the firefighters, and when a fire must be extinguished (Pike, 2003; Seedat et al, 2003;



Sutherland & Cooper, 1990).

**(j) Travel**

The work of the firefighter requires that he travel regularly, and always at high speeds (Seedat et al, 2003). This creates anxiety for firefighters because they are afraid that they may be involved in an accident (Pike, 2003; Sutherland & Cooper, 1990).

**(k) Shortage of human resources**

The population that must be served has increased, and so has the number of incidents to which firefighters must respond to with the same number of personnel (Pike, 2003). This leads to tension between firefighters because they are overworked (Seedat et al, 2003; Sutherland & Cooper, 1990).

**(l) Vastness of areas**

Long distances must sometimes be travelled, which contribute to slow response times (Seedat et al, 2003). Firefighters are then blamed for the loss of life and damage of property because they did not arrive on time (Pike, 2003; Sutherland & Cooper, 1990).

Career matters as a cause of stress originating within the work situation will now be discussed.

**2.6.2.4 Career matters**

Career matters are characterised by limited career and promotion opportunities, insufficient

training, and failure to optimally utilise the abilities and potential of firefighters (Mitchell, 1990). Insufficient training can lead to unnecessary mistakes and incorrect decisions (Beaton et al, 2001; Volpe, 2000).

Social matters as a cause of stress originating within the work situation will now be discussed.

#### **2.6.2.5 Social matters**

This section will now be analysed in terms of long or unusual working hours, absenteeism, attitude of hospital personnel, the place of residence, conflict with colleagues, offensive and intoxicated or poisoned patients, media on the scene, pressure to conform with the group, and lack of privacy.

##### **(a) Long or unsocial working hours**

Despite the physical stress, which is caused by interference with the natural sleeping rhythms of the body, the unpredictability of the working hours lead to employees never feeling secure (Torres, Maggard & Torres, 2003). The long or unsocial working hours may also interfere with the development of personal relationships and leisure activities, which could have relieved job stress to some extent (Fontana, 1994; Perry, 1999).

##### **(b) Absenteeism**

Some firefighters have stated that absence from work may be due to the abuse of sick leave and alcohol. Boredom is also a stressor in public service occupations. The significant difference between busy and quiet times, in particular can cause stress. Job stress may also

occur because of the periods of idleness when few or no calls are received at the station (Torres et al, 2003).

Boredom as a possible stressor may also play another role in the firefighting service. It is possible for a shift of twenty four hours to pass without any call-outs. Firefighters prefer action due to their personalities, and most firefighters choose the occupation because they enjoy action. Boredom may cause firefighters to wish for a 'big incident' so that there can be some action. They might even verbalise these fantasies in detail to each other (North, 2002). When such a 'big incident' does occur, some of the firefighters might feel that their wishful thinking had caused the incident, giving rise to unnecessary feelings of guilt. Furthermore, firefighters which are absent, cause that more demands are placed on the remaining firefighters (Fishkin, 1991b).

**(c) Attitude of hospital personnel**

Du Toit and Botes (1996) indicate that firefighters claim that hospital personnel are often agitated when patients are brought in because it means more work them. This often leads to conflict between firefighters and hospital personnel (North, 2002). Sometimes a firefighter does his utmost to get a patient to the hospital alive, only to see the patient die because of some logistical problems at the hospital. This leads to interpersonal anxiety and reciprocal hostility (Lemanski, 2003).

**(d) Place of residence**

When firefighters are on duty, they are expected to be at the fire station. Firefighters normally reside in the single quarters at the fire station during their duty shifts. During research conducted by Du Toit and Botes (1996), thirty two percent of firefighters

complained about the poor facilities at the fire station. The problems they experienced included a shortage of toilets and bathrooms, a lack of canteen facilities or healthy meals, and a lack of recreation facilities (Lemanski, 2003).

Some firefighters reside permanently on the fire station premises with their families. They are therefore permanently exposed to the working environment and overexposure can lead to burnout. Even when they do not perform duties, they are constantly aware of the incidents to which firefighters on duty are called because they hear the alarms and see their colleagues hastily boarding the emergency vehicles. Residing permanently on the premises of the fire station increases conflict with colleagues and family stress. Seventeen percent of the firefighters and fifteen percent of the ambulance drivers indicated that they experienced marital problems due to the stressful work that they did and the long working hours (Perry, 1999).

**(e) Conflict with colleagues**

Prolonged periods spent in the company of the same group of colleagues may cause irritability with each other (Seedat et al, 2003). Firefighters therefore need to make sure that they interact and link with people outside the work context and build on effective support structures (Lemanski, 2003; Pike, 2003).

**(f) Offensive patients**

Patients under stress are often rude and offensive to firefighters (Lemanski, 2003; North, 2002). They experience the patient's anxiety and may become anxious themselves (Pike, 2003).

**(g) Intoxicated or poisoned patients**

Firefighters regularly deal with patients that are intoxicated or have been poisoned (Pike, 2003). It is often difficult to obtain cooperation from such patients. This can leave them feeling out of control and helpless (Lemanski, 2003; Seedat et al, 2003).

**(h) Media on the scene**

The media seek sensation and can, in the process, disturb firefighters in the execution of their duties (Lemanski, 2003). These types of obstacles lead to frustration (Pike, 2003; Seedat et al, 2003).

**(i) Pressure to conform with the group**

The pressure to conform with the group contributes to feelings of alienation and isolation when a firefighter deviates from the norm in the expression of his individuality (Seedat et al, 2003). The group may even become hostile and aggressive toward the firefighter (Jerling, 2002; Lemanski, 2003).

**(j) Lack of privacy**

Fire stations are often breeding grounds for gossip (Jerling, 2002). Firefighters often feel that their privacy is invaded by colleagues and supervisors. This may leave them feeling humiliated, exposed and angry (Pike, 2003). Further causes of stress in terms of social matters include negative attitudes of colleagues, poor relationships with supervisors, inconsistency among supervisors, misuse of the firefighting service, differences of opinion

between executive and operational personnel, and contact with offensive patients and drug abusers. This can lead to negative perceptions of the public and even hostility towards them (Beaton et al, 2001).

Remuneration, fringe benefits and personnel policy as causes of stress originating within the work situation will now be discussed.

#### **2.6.2.6 Remuneration, fringe benefits and personnel policy**

This section will be analysed in terms of the lack of social status, low salaries and low expectations.

##### **Lack of social status, low salaries and low expectations**

Most firefighters identities are associated with the type of work they do and if a firefighters work is considered by significant other as inferior, it effect the firefighters self-image (Pike, 2003). Differences exist with regard to salary structures, fringe benefits and personnel policy (Fontana, 1994; Lemanski, 2003).

#### **SUMMARY**

The job stressors of firefighters can be summarised in two distinguishable areas namely *stressors arising outside the work situation* and *stressors originating within the work situation*. The causes of the stressors arising outside the work situation were characterised by marital dysfunction and divorce, limited time with family, problems with children, and lifestyle factors such as the abuse of alcohol, excessive smoking and lack of exercise. Further issues include the long shifts, which interfere with their sex lives, loss of friends (not

firefighters), suicide of colleagues or family members, lower social status, anger and frustration at home or in the family, emotional, intellectual and physical exhaustion, wives being alone at night and not being available to help the family when needed. A further exploration of some of these stressors will be conducted, quantitatively and qualitatively, in chapters five and six.

The causes of the stressors originating within the work situation manifested in terms of tasks characteristics, organisational functioning, physical working conditions and job equipment, career and social matters, remuneration, fringe benefits and personnel policy. The degree of uncertainty, exposure to human loss, interpersonal tension, shift work, overloading, underloading and traumatic incidents were flagged as main task characteristics stressors. Administrative stressors include poor administrative support, lack of leadership skills, policy and procedures, job schedules, excessive paperwork and red tape, delegation of functions, evaluation system and measurement of effectivity, responsibility versus authority, continuous focus on problems, and a lack of positive feedback. Job stressors in terms of organisational functioning were further characterised by uncertainty and unsafety.

Insufficient equipment and resources, physical working conditions, lightning, noise, vibration, climate, temperature, ventilation, humidity, hygiene, new technology, exposure to risks and dangers, travel, shortage of human resources and vastness of areas were also identified as major job stressors. Career job stressors are characterised by limited career and promotion opportunities, insufficient training, and failure to optimally utilise the abilities and potential of firefighters. Long or unusual working hours, absenteeism, attitude of hospital personnel, the place of residence, conflict with colleagues, offensive and intoxicated or poisoned patients, media on the scene, pressure to conform with the group, and lack of privacy were the main social job stressors for firefighters. The lack of social status, low salaries and low expectations were also very significant job stressors.

The reactions and symptoms of job stress amongst firefighters will be described in section 2.7.

## **2.7 THE REACTIONS AND SYMPTOMS OF JOB STRESS AMONGST FIREFIGHTERS**

It is generally assumed that firefighters are strong and trained and can cope with any job stress. However, firefighters are also sensitive, and are therefore affected by the gruesome scenes that they witness daily. Many of them cannot cope with this job stress, despite their training and the “macho” image that they portray to the world. The continuous exposure to job stress over a long period may cause certain reactions and symptoms amongst firefighters. The reactions and symptoms that will be analysed are somatic, obsessive-compulsive behaviour, interpersonal sensitivity, depression and anxiety.

### **2.7.1 Somatic symptoms**

The word *somatic* or *somatoform* derives from the Greek *soma*, meaning ‘body’. In the somatoform disorders, people have physical symptoms suggestive of physical disorders, but no organic abnormalities can be found to account for them. Moreover, there is evidence, or some reason to believe, that the symptoms reflect psychological factors or conflict (Barlow, 2002). Some people complain of problems in breathing or swallowing, or of a ‘lump in the throat’. Problems such as these can reflect overactivity of the sympathetic branch of the autonomic nervous system, which can be related to anxiety. Sometimes the symptoms take more unusual forms, as in a ‘paralysis’ of a hand or leg that is inconsistent with the working of the nervous system (Linienfeld, 1998; Nevid et al, 2003). In yet other cases, people are preoccupied with the belief that they have a serious disease, yet no evidence of a physical abnormality can be found. Several somatic symptoms can be identified name headaches, migraine headaches, asthma, nausea, vomiting, dizziness, hypertension; ulcers,



pollinosis and other allergies, tuberculosis, cancer, insomnia, excessive perspiration, impotence, muscle pain in the neck, back and shoulders, and mass loss (Smith, Manning & Petruzzello, 2001).

The following physiological reactions can be identified:

- Many firefighters find it difficult to sleep and some experience nightmares. Firefighters have reported that when they close their eyes to go to sleep, they have visions of dead bodies from a crash (Beaton et al, 1998; Moran, 1995). Many firefighters continued to smell burning flesh even after they had gone home. Some reported washing to get rid of the smell, but to no avail (Fullerton, McCarroll, Ursano & Wright, 1992).
- Many firefighters experience total physical exhaustion the evening after rescue operations at the scene of a disaster, and most of them sleep at the fire station that night. One firefighter said that, although he considered himself to be in very good physical condition, he remembered stepping on some metal in the field, falling down, and literally not having the strength to pick himself up out of the mud. His buddy helped him get up. Others described how hard it was to move in the heavy gear. Several of the firefighters had become dehydrated during their rescue operations (Fullerton et al, 1992).
- “The odors of DOAs (dead on arrival) and the victims bother firefighters. For example, one guy had a compound fracture; another guy had jungle rot on his feet. They call some of the bodies a ‘roast’. Sometimes they are bloated and full of body gases and look like they might explode. When they think of mouth-to-mouth resuscitation they know that they might have to do that on someone who was really messed up. They would have trouble. They cannot allow themselves to get too wound up early in the shift because they may have to handle more that night. They may not be able to respond effectively to

a later emergency if they become exhausted”(Fullerton et al, 1992).

Obsessive-compulsive behaviour will now be discussed.

### **2.7.2 Obsessive-compulsive behaviour**

An obsession is an intrusive and recurrent thought, idea, or urge that seems beyond the person’s ability to control. Obsessions can be potent and persistent enough to interfere with daily life and can engender significant distress and anxiety. It include doubts, impulses, and mental images. A person may wonder endlessly whether or not he or she has locked the doors and shut the windows, for example (Nevid et al, 2005). A person may be obsessed with the impulse to do harm to their spouse. Images can be harbor, such as the recurrent fantasy of a young mother that her children had been run over by traffic on the way home from school (Davison, Neale & Kring, 2004).

A compulsion is a repetitive behaviour (such as hand-washing or checking door locks) or mental acts (such as praying, repeating certain words, or counting) that the person feels compelled or driven to perform. Compulsions often occur in response to obsessional thoughts and are frequent and forceful enough to interfere with daily life or cause significant distress (Comer, 1998). Some people literally take hours checking and rechecking that all the appliances are off before they leave home, and then doubts still remain (Nevid et al, 2005).

Most compulsions fall into two categories: checking rituals and cleaning rituals. Rituals can become the focal point of life. Checking rituals, such as repeatedly checking that the doors are securely locked before leaving the house, cause delays and annoy companions, and cleaning can occupy several hours a day. (Davison et al, 2004). Compulsions often

accompany obsessions and appear to at least partially relieve the anxiety created by obsessional thinking. By washing hands 40 or 50 times in a row each time a public doorknob is touched, the compulsive hand-washer may experience some relief from the anxiety engendered by the obsessive thought that germs or dirt still linger in the folds of skin (Nevid et al, 2005). The person may believe the compulsive act will help prevent some dreaded event from occurring, even though there is no realistic basis to the belief or the behaviour far exceeds what is reasonable under the circumstances. Compulsive rituals apparently also reduce the anxiety that would occur if they were prevented from being carried out (Foa, 1990).

Examples of obsessive thoughts and compulsive behaviours amongst firefighters are depicted in Table 2.3 (Garcia, 2003; Phebe, Pfefferbaum, Nixon & Dickson, 2000; Young, 2001).

**Table 2.3: Examples of obsessive thoughts and compulsive behaviours amongst firefighters**  
(Garcia, 2003; Phebe, Pfefferbaum, Nixon & Dickson, 2000; Young, 2001)

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**Table 2.3**

*Examples of obsessive thoughts and compulsive behaviours amongst firefighters*

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**Obsessive thought patterns**

- Firefighters may think that their bodies remain dirty after working with protective clothing despite repeated washing.
- Firefighters may think that a loved one may be hurt or killed in a car accident.
- Firefighters may repeatedly think that they have left the door to the control room unlocked.
- Firefighters may worry constantly that they did not check the firefighting equipment.

**Compulsive behaviour patterns**

- Firefighters may recheck their work time and time again.
- Firefighters may recheck that they did check the firefighting equipment.
- Firefighters may constantly wash themselves to keep clean and germ free.

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Interpersonal sensitivity will now be discussed.

**2.7.3 Interpersonal sensitivity**

Interpersonal sensitivity can be described as the characteristic pattern of a person to perceive, or to perceive or interpret, the relationship between the person self and other persons (Plug, Meyer, Louw & Gouws, 1991). Relationships can either make a person's work pleasurable or miserable. People strive to perfect the art of identifying and resolving conflict situations - positive and negative. Both conflict and risk represent a major part of a person's job, since stress exist whenever people work together in organised settings (Gmelch, 1982; Gmelch & Chan, 1994).

Good working relationships, according to several behavioural scientists, contribute to a healthy work environment. A healthy working relationship depends on support, trust and cooperation. The Goddard study at NASA (Cooper & Marshall, 1976) found poor relationships, defined as low trust, low support, and low job satisfaction and the feeling of being threatened - or psychological stress. Several other studies found that mistrust led to poor communication and strain (Gmelch, 1982; Gmelch & Chan, 1994).

Several theories emphasise that interpersonal sensitivity are closely related to sociotropy, or social dependance, which refers to a set of invested beliefs, attitudes, and goals that emphasise positive interchange with others. An individual who is sociotropic yearns to secure and maintain interpersonal attachments and interactions. Sociotropic persons believe that social goals, such as attaining acceptance, understanding, support, guidance, and intimacy, are critical for their self-worth (Beck, 1983; Beck, Epstein, Harrison & Emery, 1983; Clark, Beck & Brown, 1992; Cohen, Pane & Smith, 1997).

Sociotropic persons also tend to fear rejection, disapproval, neglect, and other adverse interpersonal situations because of the perceived threat to their self-definition. Autonomy, or individuality, on the other hand, refers to a person's investment in increasing and maintaining a sense of independence, individuality, mobility, and achievement. Autonomous persons believe that independence and goal attainment are important for their self-worth, and fear such threatening situations as failure, constriction of goals, and immobility (Dozois & Backs-Dermott, 2000).

According to Beck's (1983) diathesis-stress model, depressive symptoms are more likely to follow stressful life events when negative events match an individual's personal motivational vulnerability. This 'congruency hypothesis' does not assert that the mere occurrence of a negative life stressor will invariably lead to depression, but rather, that one's perceptions or appraisals of stressors with respect to the self are critical determinants (Abela, McIntyre-Smith & Dechef, 2003). According to the congruency hypothesis, sociotropic individuals are predicted to exhibit more depression in relation to negative interpersonal events (e.g. rejection), autonomous individuals, on the other hand, are purported to be more vulnerable to achievement-related events (e.g. failure) (Dozois & Backs-Dermott, 2000).

Beck's (1983) cognitive theory emphasise the role of interpersonal sensitivity in the onset and maintenance of depression. For example, sociotropic firefighters are vulnerable to depression because of their rigid, perfectionistic, and unrealistic expectations of interpersonal relations. Sociotropic and dependent (i.e. interpersonally sensitive) firefighters are thought to be excessively invested in positive interactions with others, and to have heightened needs for acceptance and support (Coyne & Whiffen, 1995). Events interpreted as conflict or loss by these firefighters will activate their vulnerabilities, and their resultant negative affect will vary depending on their ability to reestablish interpersonal contact (Blatt & Bers, 1993). One of the ways that interpersonal sensitivity is associated with depression concerns the firefighter's implications for negative affect regulation in the face of interpersonal stress (O'Neill, Cohen, Tolpin & Gunthert, 2004).

Dependent firefighters are focused on interpersonal issues, they need others' approval to maintain a sense of well-being. Depression is triggered in dependent firefighters when they perceive disruptions in their relationships with others, interpersonal loss, abandonment, or social rejection (O'Neill et al, 2004). When depressed, their affective states are characterised by feelings of loneliness, helplessness, weakness, and emptiness. Self-critical individuals, on the other hand, are focused on achievement issues, they need to meet their own and/or others' standards to maintain a sense of well-being. Firefighters high in self-criticism will become depressed when they perceive they are not meeting such standards. When depressed, their affective states are characterised by feelings of worthlessness, guilt, inferiority, and self-disappointment (Abela, et al, 2003)

A further perspective of depression will be provided in the following section.

#### **2.7.4 Depression**

All firefighters have experienced small doses of depression at some time in their life, and possibly larger doses during the active phase of a life crisis (Fishkin, 1992). Hopefully, firefighters recover with few scars, and gain some new insight about their life, such as who they are and how they handle the emotional demands placed upon them, as well as those they place upon themselves (Monnier, Cameron, Hobfoll & Gribble, 2000).

For some firefighters, however, the combination of life's calamities coupled with the perceived inability to affect a change in their life, become too much to bear (Monnier et al, 2000). The result is often a breakdown of psychological defences, leading into the downward mental and emotional spiral of despair, ultimately resulting in the emotional state of depression, from which the road is often painful and difficult (Fishkin, 1992).

It is also ironic that for many firefighters, the year-end holidays also trigger or accentuate the emotional experience of depression. They enter a state that is called the *Holiday Blues*, characterised by depression, anxiety, and not infrequently a deep sense of aloneness. For some firefighters, a feeling of dread precedes the holiday experience (Fishkin, 1992). It is rather strange that during this time of the year, when expectations run so high for happiness, peace, joy, sharing and togetherness, the deepest fears and downside emotions are experienced by so many firefighters (Monnier et al, 2000).

Depression is generally not the result of a single experience or event. Most often, it is the painful, emotional outcome of an interaction of factors or circumstances such as genetic and biological make-up, early life experiences, the character of the role models people emulate, the unique way of perceiving the world and processing information, and how people handle frustration (Fishkin, 1992; Monnier et al, 2000).

From clinical observations, it is significant to note that in most cases, individuals

experiencing a primary depression show symptoms similar to those that are evident in patients experiencing exhaustion-burnout (Monnier et al, 2000). However, if *frequently becomes a primary emotional aspect of those suffering the effects of occupational burnout*. A description of the symptoms of depression will now be presented (Fishkin, 1992).

#### **2.7.4.1 The symptoms of depression**

There are a number of symptoms usually present and generally shared by those experiencing a major depression. Depressed firefighters are often not aware of the emotional changes taking place within them. Yet their families, friends and fellow firefighters are able to see quite clearly the all-encompassing effects of the depression (Monnier et al, 2000). The following symptoms are generally seen in most cases of primary depression, with some variation based upon the individual's personality characteristics:

##### **(a) Dysphoric mood**

The symptom most generally associated with depression is an all-pervasive sense of doom and gloom, that sinking experience that is so often equated with a feeling of 'internal death' (Fishkin, 1992). As this mood takes hold, the pain becomes so great that there is a resultant loss of interest in previously gratifying pursuits, such as hobbies, sport activities, and other pastimes (Elliot, Goldberg, Duncan & Kuehl, 2004; Monnier et al, 2000).

##### **(b) Social withdrawal**

Loss of pleasure and meaning in life has a profound effect on the family and social sphere of the firefighter. It is as if the depressed firefighter crawls into a cocoon in order to protect himself from the outside world (Monnier et al, 2000). Yet in reality, the firefighter's



internal process, not the outside world, is primarily responsible for his depression and the resulting sense of loss and despair (Elliot et al, 2004; Fishkin, 1992).

**©) Psychomotor retardation and significantly decreased energy levels**

The neurochemical theory of depression postulates that the neurotransmitters, norepinephrine (the brain's equivalent of adrenaline) and serotonin (which is similar in action to adrenalin), are absorbed by the brain in an accelerated fashion when one is in a state of depression (Elliot et al, 2004). This process is equivalent to an out-of-tune carburettor that uses too much gas, and takes in too little oxygen, so that the engine lacks the energy to do its job effectively and efficiently (Fishkin, 1992; Monnier et al, 2000).

**(d) Appetite changes**

This symptom is manifested as either a loss of interest in food, or compulsive binge eating. In the latter case, most firefighters state that they eat not because they are hungry, but rather from a deep sense of frustration or anger, the cause of which they do not understand (Elliot et al, 2004). In either case, the firefighter experiencing depression will often exhibit a marked change in body mass (Fishkin, 1992; Monnier et al, 2000).

**(e) Sleep disorders**

Disorders of sleep patterns are a general among firefighters suffering from depression. Characteristically they wake up early in the morning, after which they find it difficult to fall asleep again (Elliot et al, 2004). Depressive firefighters also wake up frequently during the night. Others tend to sleep a lot (to escape), but state that they still feel exhausted (Luw, 1989; Monnier et al, 2000).

**(f) Low self-esteem and feelings of guilt**

The low self-esteem ranges from feelings of inadequacy to unrealistic negative self-evaluations. This “proof” contributes to internal feelings of guilt relating to the firefighter’s supposed role in some or other tragedy – which in turn lower his self-esteem: an evil cycle (Elliot et al, 2004; Louw, 1989; Monnier et al, 2000).

**(g) Inability to think and concentrate**

Just like their physical processes, the psychological processes of depressive firefighters also decrease. They complain that they find it difficult to think clearly, to concentrate, and to take decisions or to remember them (Louw, 1989; Monnier et al, 2000).

**(h) Repetitive thoughts concerning death or suicide**

When considering the clinical image of depression in firefighters, is it understandable that many depressive firefighters’ thoughts are focussed on death or suicide. A firefighter may, for example, state that other people will be better off when he is dead, or he will express the wish to be dead. Statements like these place tremendous stress on the family (Banauch, McLaughlin, Hirschhorn & Cooigan, 2002; Elliot et al, 2004). The developmental/counselling job and family stress programme could provide assistance to depressive firefighters and their families to cope with the situation. Suicide amongst firefighters will be discussed as a further cause of stress amongst firefighters’ families (Louw, 1989; Monnier et al, 2000).

**(i) Anxiety, fear, and a heightened concern regarding physical ailments**

These symptoms form an important aspect of the clinical picture of depression. Anxiety, which is very often the result of changes in brain chemistry, may take the form of psychomotor agitation, tremor, tenseness, irritability, and incapacity to experience a sense of comfort and peacefulness (Elliot et al, 2004). Firefighters in depression generate thoughts of a foreboding nature. Anticipation of the unknown also adds to the state of anxiety, compounding the symptoms of depression (Fishkin, 1992; Monnier et al, 2000).

Anxiety will be analysed in further detail in the following section.

### **2.7.5 Anxiety**

Anxiety is a generalised state of apprehension or foreboding, an emotional state characterised by physiological arousal and unpleasant feelings of tension. There is much to be anxious about - health, social relationships, examinations, careers, international relations, and the condition of the environment are but a few sources of possible concern (Davison et al, 2004). It is normal, even adaptive, to be somewhat anxious about these aspects of life. Anxiety is an appropriate response to threats, but anxiety can be abnormal when its level is out of proportion to a threat, or when it seems to come out of the blue - that is, when it is not in response to environmental changes. In extreme forms, anxiety can impair people's daily functioning (Nevid et al, 2005).

Physical features of anxiety amongst firefighters may include trembling or shaking of the hands or limbs, heavy perspiration, shortness of breath or shallow breathing, heart pounding or racing, dizziness, weakness or numbness, stiffness of the neck or back, upset stomach or nausea, diarrhea, feeling irritable or 'on edge', jumpiness, jitteriness, sensations of a tight band around the hands or limbs, tightness in the pit of the stomach or chest, sweaty palms, light-headedness or faintness, dryness in the mouth or throat, difficulty talking and catching

one's breath, tremulousness in one's voice, cold fingers or limbs, difficulty swallowing, a 'lump in the throat', choking or smothering sensations, cold, clammy hands, hot or cold spells, frequent urination, and feeling flushed (Davison et al, 2004; Nevid et al, 2005).

Behavioural features of anxiety may include avoidance behaviour, clinging, dependent behaviour and agitated behaviour. Cognitive features of anxiety may include worrying about something, a nagging sense of dread or apprehension about the future, belief that something dreadful is going to happen, with no clear cause, preoccupation with bodily sensations, feeling threatened by people or events that are normally of little or no concern, fear of losing control, fear of inability to cope with one's problems, thinking things are getting out of hand, thinking the world is caving in, thinking things are swimming by too rapidly to take charge of them, worrying about every little thing, thinking the same disturbing thought over and over, thinking that one must flee crowded places or else pass out, finding one's thoughts jumbled or confused, not being able to shake off nagging thoughts, thinking that one is going to die, even when one's doctor finds nothing medically wrong, worrying that one is going to be left alone and difficulty concentrating or focusing one's thoughts (Davison et al, 2004; Nevid et al, 2005).

Firefighters do not talk about their own anxieties, but they do worry about their personal safety, the safety of their colleagues, and the impact that a mistake can have on them and on others. Firefighters are therefore always in a state of readiness which causes exhaustion (Banauch et al, 2002). Firefighters may suffer from anxiety disorders such as posttraumatic stress disorder and acute stress disorder. Posttraumatic stress disorder refers to the re-experiencing of a highly traumatic event accompanied by heightened arousal and avoidance of stimuli associated with the event. Acute stress disorder refers to the features similar to those of posttraumatic stress disorder but limited to the days and weeks following exposure to the trauma. An example is the research conducted by Banauch et al (2002), of New York

City Fire Department rescue workers after responding to the World Trade Centre attacks. The report describes morbidity and mortality in the Fire Department of New York rescue workers during the 11-month period after the World Trade Centre attacks and documents a substantial increase in respiratory and stress-related illness compared with the time before the World Trade Centre attacks. Stress-related illnesses include post-traumatic stress disorders, depression, anxiety disorders, and bereavement issues (Banauch et al, 2002; Phebe et al, 2000; Young, 2001).

The psychological reactions of job stress amongst firefighters will now be discussed.

### **2.7.6 Psychological reactions**

The following psychological reactions will be discussed in more detail: identification with the victims and the dead, helplessness and guilt, fear of the unknown and physical reaction on the alarm.

#### **2.7.6.1 Identification with the victims and the dead**

A firefighter heard a voice calling out for help near the burning plane, found a 14-year-old boy on the ground, picked him up, and carried him a distance from the plane. The firefighter told the boy that someone would arrive shortly to take him to safety. He then left the boy and continued to fight the fire. Since the incident the firefighter had continued to feel tormented: he felt he should have taken the boy to safety rather than leave him and found himself thinking about the incident, and especially the boy's face all the time (Monnier, Cameron, Hobfoll & Gribble, 2002). He checked on the boy in the hospital and learned that he was doing well, but he continued to feel guilty. The firefighter said his own son was about the age of the boy from the crash. His son had been living with his ex-wife since his divorce.

He felt guilty because he had “given up” his own son. He cried as he expressed these difficult feelings about his own son (Fullerton et al, 1992).

Identification with victims and the dead is further indicated in the following abstract: “What makes the biggest impact is seeing a dead firefighter - it brings it home. I went to a line-of-duty funeral. It was a solemn occasion. Afterwards we had a party. It was an escape and also a celebration of life. The reality of that funeral was that it could have been you” (Fullerton et al, 1992). “Someone who is injured is different from someone who is dead. A firefighter cannot sympathize with the dead. Burns are difficult for firefighters. They do not want to look at the face because it may remind them of someone they know. They just put them in a body bag. But children - they are *more* dead! In one incident, firefighters found seven out of the nine bodies (Moran, 1997). They picked up the body of a two-year-old girl. Feelings ran through their bodies. What bothered them the most was that it was a mirror image of their families. A few years ago there was a Christmas fire involving a mother and four kids. They heard the screams but could not get to them because the fire was too much. They think about that every Christmas”(Fullerton et al, 1992).

#### **2.7.6.2 Helplessness and guilt**

The firefighters responsible for operating one of the fire trucks found that the hose would not work, although the truck had recently been serviced, and was forced back to the fire station during a critical time. When they arrived at the fire station, the fire truck seemed to be functioning properly (Boxer & Wild, 1993). Feeling they had wasted valuable time returning to the fire station, the firefighters hurried back to the burning plane. Here, the fire truck again failed to function. They asked another fire-fighter to help, thinking they had overlooked something, but they were not able to get the fire truck to function properly and were angry and frustrated (Lewis, 1994). After the disaster, the firefighters originally

responsible for the fire truck felt guilty that they could not help to extinguish the fire during a time when they were needed. Several weeks later, they felt relieved to hear that the fire truck was one of several that had been serviced with a defective valve and that the fire truck was therefore recalled by the manufacturer (Fullerton et al, 1992).

In another example, firefighters described long hours of very difficult rescue work. They fought the fire and assisted in the search for survivors. They worked with mutilated bodies all around them (Monnier et al, 2002). They were exhausted when their work was completed. None of the firefighters had experienced this type of mass casualty event before. Despite the situation, nearly all expressed the feeling that they “should have done more” (Fullerton et al, 1992).

The discussion of helplessness and guilt can be concluded with the following comments made by a firefighter: “In firefighting it is critical how long it takes you to find somebody and sometimes it is just too late to save them. We try to make it easier on each other. We tell each other, ‘hey, you did all you could. They were dead before the bells went off and there was nothing more you could have done to save them.’ One person had 80 percent third-degree burns, was incoherent, and died the following day. You feel helpless” (Fullerton et al, 1992).

### **2.7.6.3 Fear of the unknown**

Fear of the unknown will be explained by the following two examples:

- Several firefighters described feeling a ‘strange sensation’ driving into the cornfield. They had difficulty seeing the ground because of the high corn, the deep mud, and the smoke from the fire (Murphy, Beaton, Pike & Johnson, 1999). The firefighters connected this feeling with the uncertainty about whether they were driving over bodies -

dead or possibly alive. They related the feeling to not knowing what was beneath the truck (Fullerton et al, 1992).

- ‘I went into a room full of smoke and I could not see at all. I had to feel my way around the room. It was a strange feeling not knowing what I would find. Then I touched something and felt relief - I told myself it was a dog. But then I realized that it was not a dog at all - it was a dead infant.’(Fullerton et al, 1992).

#### **2.7.6.4 Physical reaction on the alarm**

When the alarm goes off, adrenalin is secreted, which makes the body ready for action. Part of the firefighters energy is released on the scene, but the increased adrenalin, blood sugar levels, blood pressure and muscular tension can still be felt for hours after (Seedat, La Grange, Niehaus & Stein, 2003).

### **SUMMARY**

The symptoms of job stress amongst firefighters can be summarised in the following areas namely somatic symptoms, obsessive-compulsive behaviour, interpersonal sensitivity, depression and anxiety. The symptoms can be viewed as symptoms that might manifest in a wide spectrum of the firefighting population in similar or different circumstances. Somatic symptoms refers to physical symptoms suggestive of physical disorders, but no organic abnormalities can be found to account for them. Moreover, there is evidence, or some reason to believe, that the symptoms reflect psychological factors or conflict.

Obsessive-compulsive behaviour refers to an obsession which is an intrusive and recurrent thought, idea, or urge that seems beyond the person’s ability to control. Obsessions can be



potent and persistent enough to interfere with daily life and can engender significant distress and anxiety. A compulsion is a repetitive behaviour or mental acts that the person feels compelled or driven to perform. Interpersonal sensitivity can be described as a characteristic pattern of a person to perceive, or to perceive or interpret, the relationship between the person self and other persons.

Depression refers to a breakdown of psychological defences, leading into the downward mental and emotional spiral of despair, ultimately resulting in the emotional state of depression, from which the road is often painful and difficult. Anxiety is a generalised state of apprehension or foreboding, an emotional state characterised by physiological arousal and unpleasant feelings of tension. Considering the descriptions of the afore-mentioned symptoms and psychological reactions such as identification with the victims and the dead, helplessness and guilt, fear of the unknown and physical reaction on the alarm, it becomes apparent that anxiety forms a part of almost all of these symptoms and reactions. The empirical measurement of the symptoms by means of the Stress questionnaire will provide a better understanding of the causes of stress and how it precipitate in intra-psychical and interpersonal outcomes.

! This concludes the literature review undertaken to support the empirical aims of this research, and in particular to theoretically describe and analyse job stress amongst firefighters in the South African context.

A summary of the chapter will be provided in section 2.8.

## **2.8 CHAPTER SUMMARY**

This chapter has described job stress amongst firefighters. The unique job context of

firefighters was described in terms of two scenarios, namely the attacks on the World Trade Centre (New York) and the raging inferno at the Munitoria (Pretoria). Job analyses of the Learner Firefighter Gr I-II/Junior-/Senior Firefighter, Leading Firefighter, Station Officer and Divisional Officer were provided to illustrate the uniqueness of the job context of firefighters.

Stress in general was defined by differentiating between stressors, stress and strain, as well as the types of psychological stressors. The effect of the stressor type on the duration of strain added further clarification of the definition of stress. Thereafter job stress was defined. The physical reactions of job stress and the nature of job stress were described. The job stress model of Cox and McKay concluded the discussion.

The model of job stressors of firefighters were explained in terms of the causes arising outside the work situation and causes originating within the work situation. Task characteristics, organisational functioning, physical working conditions and job equipment, career and social matters and remuneration, fringe benefits and personnel policy were analysed as causes originating within the work situation. The psychological reactions of job stress amongst firefighters were further explained by a discussion of the identification with the victims and the dead, helplessness and guilt, fear of the unknown and physical reaction on the alarm. Family stress amongst firefighters will be discussed in **Chapter 3**.