NAME: **Celani Carol Dumakude**

Department: **Psychology**

Faculty: **Arts**

Degree: **PhD in Community Psychology**

Supervisor: **Prof H. S. B. Ngcobo**

Title: **A Qualitative Analysis of Post-Traumatic Stress Disorder Experiences at the Slater Coal Mining Industry**

University of Zululand

Dedication

This academic work is dedicated to Alondwe Dumakude, my lovely daughter, and her mother Mrs Nompumelelo. H. Dumakude, my dearest wife, who were so tolerant of my absence from home, while I was busy with my PhD coursework and eventually writing this thesis.

Acknowledgements

I would like to express my gratitude to everyone who contributed in the process of conducting this study. I particularly wish to express my sincere appreciation to the following people without whom this thesis would not have been written:

(i) Professor Ngcobo for his supervision and guidance in the writing of the proposal and guidance in writing this thesis.

(ii) Management of the Slater Coal Mines for allowing mineworkers to participate in the study.

(iii) Workers of the Slater Coal Mines for dedicating their spare time to participate in the study

Declaration

Unless otherwise stated to the contrary, this thesis is the product of my own hard work.

……

Mr C. C. Dumakude

Table of Contents

Abstract

This qualitative study investigated the prevalence of post-traumatic stress disorder within the mining industry. It further reviewed systems used to manage the same disorder following a disastrous mining accident in the Slater Coal Mines. There are key challenges that were reviewed as part of improving diagnosis and management of post-traumatic stress disorder. Two focus groups consisting of six African mineworkers, working in the Slater Coal Mines, were conducted. All participants were isiZulu speakers. The data was analysed using grounded theory, which is a qualitative technique. In using this data analysis technique, data labelling, open coding, axial coding and selective coding were the steps that were followed as a guide. Research findings indicated that post-traumatic stress disorder is prevalent within the mining industry and differs from post-traumatic stress. Existence of post-traumatic stress disorder was represented by symptoms such as intrusive thoughts, avoidant behaviours and terror. Further, causes of mining accidents and accident management measures were the findings. Different work conditions were implicated in the study as contributing to trauma in the mines in addition to accidents that happen underground.

Chapter One
Introduction

The reason for conducting this study roots from the existence of a variety of work-related difficulties that employees in general usually encounter in different industries. Industries differ from one to the other and this difference contributes to the kinds of problems that employees encounter. Work-related difficulties also differ because employees within the same industry have different responsibilities. The level of qualification and work experience contribute to the difference of the workers' responsibilities and to the extent to which employees get exposure to traumatic experiences. Traumatic experiences have different negative effects on the employees and their effects can be emotional, psychological, social, physical, occupational and financial.

The mining industry also has difficulties that employees encounter and impact negatively on their quality of life. The focus on the mining industry is informed by the important role that this industry plays in the economy of the South African country. Lee and Mohammed (2006) are aware of this role as they note that the vital part of the South African economy has always been the 'blue-collar' workforce, which are the engine of South African mining and industrial heritage as well as the backbone of socio-political transformation.

Traumatic incidents seem to be a leading problem within the mining industry. Although the accidents that frequently occur within the mining industry have different negative effects, they have a significant contribution to the epidemiology of post-traumatic stress disorder. Sdorow (1993) defines post-traumatic stress disorder as "a syndrome of physical and psychological symptoms that appears as a delayed response after exposure to an extremely emotionally distressing event" (p. 756). Aligned with the fatal effects that accidents have in the mines, Hermanus (1991) reports that between the 1900 and 1991, over 68 000 mineworkers died through accidents in the South African mines and more than one million workers were permanently disabled (Swanepoel, Erasmus, van Wyk & Schenk, 2003). This report suggests that there is a need for improvement of safety measures within the mining industry.

Literature and skills that clinicians use to diagnose post-traumatic stress disorder and other psychiatric problems are traditionally Eurocentric. Traditional African workers dominate the mining industry on which the study focused. Therefore the researcher intended to

compare symptoms by which post-traumatic stress disorder presents itself according to the literature against the symptoms that mineworkers present after they have been involved in a traumatic incident in their line of work. Achieving the mentioned goal will hopefully, enhance the applicability of the current diagnostic criteria of post-traumatic stress disorder to the traditionally African psychiatric patients.

In addition, there is a possibility for the study to gather information on the strategies that African mineworkers use to cope with post-traumatic stress disorder. The study focused on the employees of the Slater Coal Mine particularly their experiences after their involvement in traumatic incidents that seem to be unfortunately frequent within the mining industry.

1.1. Motivation for the Study

There is a lot of literature that focuses on Post-traumatic Stress Disorder (PTSD) and other psychiatric disorders that usually result from the exposure to disastrous incidents. However, there is still a lack of literature that focuses on psychiatric disorders that result from accidents occurring in the mining industry. There is hope that conducting this study will improve the relevance of literature on PTSD within the mining industry. There is likelihood for this study to improve the applicability of already existing psychological theories to the mining industry. Possibly, conducting such a study will play a role in mobilising the resources that workers in the mining industry have and can use to minimise mining disasters proactively.

Most of the mining industries are frequently introducing new technology used to process coal and other minerals. Managing mining accidents is one of the aims of introducing the new technology. This study hoped to find out whether this technological improvement has any effect on limiting the accidents that occur in the Slater Coal Mines.

1.2. Aims and objectives of the study

There is a variety of mental disorders that result from traumatic incidents that occur in the mining industry. The resultant disturbances impact negatively on victims' areas such as social, occupational, and interpersonal functioning. Interruption of interpersonal functioning is likely to affect the survivors' relationship with their significant others. Some of the impairments can be short-term and representative of acute stress whereas other problems can be chronic and develop into problems such as post-traumatic stress disorder.

This study intended to analyse the level of post-traumatic stress disorder in the mining industry. The study was further aimed at exploring the strategies that mineworkers use to cope with post-traumatic stress disorder that they experience in their line of work. Symptoms by which post-traumatic stress disorder usually presents itself were also the focus of the study. The researcher was aware that employees at Slater Coal Mines do not have standard facilities that they use to manage post-traumatic stress disorder however; finding out whether there are rudimentary strategies they presently use to cope with post-traumatic stress disorder was one of the researcher's aims. Finding out about these strategies would contribute towards the development of the professional measures that they feel are necessary to manage the same problem. To get their views on what to use to manage post-traumatic stress disorder and other possible problems in the mining industries would make employers feel that they can play an important role in the management of their work-related difficulties.

The current study aimed at:

- Describing and identifying risk factors, determinants and manifestations of PTSD in the mining industry.
- Reviewing the systems of managing mental health disorders and interventions following disastrous incidents in the mines.
- Recommending the key challenges to be addressed in improving the diagnosis and management of PTSD in the mining industry.

Chapter Two

Literature Review

There are different ways through which psychiatric disorders manifest. Differences in the manifestation of psychiatric disorders emanate from the observation that their causes and possibly their triggering situations are different. Post-traumatic stress disorder (PTSD) is also one of the psychiatric disorders prevalent in the South African mining industry.

This chapter aims at outlining theoretical aspects of post-traumatic stress disorder to enhance its understanding. It continues by presenting features that differentiate post-traumatic stress disorder from post-traumatic stress. Some vulnerability factors are outlined followed by the causes of traumatic accidents in the mines. Some measures that are important in managing traumatic accidents in the mining industry will be discussed. These measures work in relation to employee assistance programme, debriefing, individual therapy, group therapy, pharmacotherapy and relaxation training.

2.1. Theoretical Background

Discussing behaviour theory, cognitive and information-processing theory and psychodynamic theory can enhance understanding of post-traumatic stress disorder.

(i) Behaviour Theory

As part of the causes of post-traumatic stress disorder in different contexts, Kaplan and Sadock (2009) argue that the behaviour theory posits a two-factor learning process in post-traumatic stress disorder. They argue that in the first phase, persons exposed to trauma, regarded as an unconditioned stimulus, learn by association to be upset by central events, images, thoughts, or situations that occur in a proximity to the trauma, which is a conditioned stimulus.

Kaplan and Sadock (2009) regard instrumental learning as leading to the second factor, which is the avoidance of both unconditioned stimulus and conditioned stimulus. They believe that this stimulus generalisation is sustained because it decreases anxiety on the victim. This process ends up in over-generalisation in which a victim perceives a wide range of stimuli as eliciting similar arousal. The explanation that behaviour theory holds is comparable to the explanation that the cognitive and information processing theory provides.

(ii) Cognitive and Information-processing Theory

In association with the behaviour theory, Kaplan and Sadock (2009) regard cognitive and information-processing models as able to account for the development of post-traumatic stress disorder. Based on the cognitive and information-processing model, Kaplan and Sadock (2009) believe that fear can be stored as a memory network that contains information about danger-related stimuli.

Cognitive and information-processing theory views post-traumatic stress disorder as developing after a severe stress when a person is unable to process and assimilate the event adequately or to deal with its effects effectively. They believe that trauma may require its victims to make unaccustomed changes in their plans to respond to overwhelming situations. This nature of trauma makes the satisfactory assimilation of the experience difficult, longer and incomplete. Fear structure remains intense and easily activated because trauma is life threatening and elicits powerful response in the victim.

Kaplan and Sadock (2009) believe that the traumatic experience remains alive as an active memory and repeatedly intrudes into the victim's awareness. The idea that such trauma experiences are painful makes trauma victims deny or avoid the experience. Such denial and avoidance decrease levels of anxiety in a victim. Although denial and avoidance are coping mechanisms, they are maladaptive and their benefit is short-term. In addition, Kaplan and Sadock (2009) believe that in post-traumatic stress disorder, there is an alternation between the intrusive and avoidance phases. Possibly, intrusion and avoidance depend on the victim's level of consciousness.

(iii) Psychodynamic Theory

The psychodynamic explanation of post-traumatic stress disorder originates from the times of Sigmund Freud. This is supported by Kaplan and Sadock's (2009) argument that Freud and other analysts attempted to explain the symptoms and the cause of traumatic neurosis. Based on these early contentions, Kaplan and Sadock (2009) note that trauma revives the original childhood neurosis through regression. This view of trauma led to the postulation of the energy model according to which the strong external trauma causes a disturbance in the organism's energy. The stimulus barrier, which serves as a protective shield is exceeded. The mentioned importance of childhood neurosis and regression, mineworkers'

ability to cope with mining accidents and trauma partly depends on the nature of their early development history.

Maladaptive defence mechanisms such as repression of a traumatic event and undoing, in dreams and compulsive repetition of the trauma are the ego's attempts to cope with the event draining off the excess energy (Kaplan & Sadock, 2009). Kaplan and Sadock (2009) also regard fixation as important in the psychodynamic theory. In relation to fixation, severe trauma with a chronic course and a poor response to treatment may lead to ego exhaustion and changes in the ego-superego boundary resulting from overwhelming guilt and shame.

Following the psychodynamic theory, other analysts revised the concept of stimulus barrier and changed it from a passive shield to an active attempt of the ego to protect itself against traumatization. Based on these analysts' view, trauma must be understood in terms of the victim's psychic reality and the way the victim interprets and reacts to that experience (Kaplan & Sadock, 2009). This idea suggests that clinicians need to view each case with its uniqueness because different mining trauma victims barely have a similar understanding of a mutually experienced traumatic event. Depending on the victim's view of a situation, psychic trauma may result in the victim being overwhelmed with emotions and becoming terrified by the uncontrollable elements of one's emotions. Affect in the psychodynamic theory explains phenomena such as affective blocking and chronic depression (Kaplan & Sadock, 2009). This is suggestive of the relationship between post-traumatic stress disorder and depression as they both share the aspect of affect. To enhance understanding of post-traumatic stress disorder further, it is important to differentiate it from stress.

2.2. Post-traumatic Stress Disorder and Stress

Literature indicates that post-traumatic stress is a normal response to an extremely challenging event albeit followed by a normal recovery. There is a belief that chronic post-traumatic stress disorder develops when the normal recovery fails and a suffering individual struggles to assimilate the experience such that the acute symptoms persist and intensify (Campfield & Hills, 2001). Based on Campfield and Hills' view, diagnosticians need to be aware of the difference between post-traumatic stress, which seems normal given the traumatic experience, and post-traumatic stress disorder. Defining stress and

trauma can also facilitate the differentiation of post-traumatic stress from post-traumatic stress disorder.

2.2.1. Definition of Stress

There are different definitions for the concept of stress and the context has an effect on this difference. In the context of work, Carrel, Elbert, Hatfield, Globbler, Marx and van der Schyf (1996) define stress as a "discrepancy between an employee's perceived state and desired state, when such a discrepancy is considered as important by the employee" (p. 418). The emphasis of subjectivity of the mentioned discrepancy is closely related to the above psychodynamic view. Reber (1985) views the word trauma as stemming from a Greek word 'wound' which refers to physical injury caused by direct external force or psychological injury caused by extreme emotional assault (Staines, 2000). Relevance of this definition emanates from the idea that traumatic incidents, involving survivors in the mines, inflict physical injuries whereas consequential effects including invasive thoughts and other psychiatric symptoms come with negative emotional impacts.

Stress and trauma have negative effects on the employees' well-being and likely to negatively affect their work performance. It is important to note that the felt discrepancy, when someone is stressed, is not universal but relates with victims cognitive appraisal of a traumatic situation. In the context of mining industry, an accident survivor may wish to know whether his or her catastrophic thoughts that a similar accident will occur again, are real or non-real so that one may stop having negative thoughts that are out of proportion. Duffy and Wong, (1996) regard stress responses as varying from physiological reactions such as ulcers or high blood pressure to psychological responses such as avoidance of a stressful event in the future to the serious psychological conditions called learned helplessness. Avoidance, as one of the stressful responses, may persist until the survivor develops post-traumatic stress disorder.

Survivors may experience work-related stress at different levels as Maslach (1986) categorises it into personal, interpersonal and organisational level. According to Maslach (1986), workers report stress in a form of anxiety, substance abuse, emotional exhaustion, fatigue, feelings of isolation and suicidal ideation at a personal level. At an interpersonal level, Maslach believes that stress includes relationship problems, difficulties in managing stressful work situations and demands from colleagues. Maslach perceives stress at

organisational level as including aspects such as feelings of disillusionment regarding the occupation and its conditions. According to Moedryk (1983), van Zyl (1996) and Smallegan (1989), at organisational level, stress includes issues that are related to work-place expectations. The workers may have strong feelings and expectations regarding the organisation's response in terms of support given in relation to the relevant issues, but it is assumed that in only exceptional circumstances will broader work-life issues be seen as core workplace issues (Lee & Mohammed, 2006). All of the above-mentioned levels of stress exist in the context of mining industry.

Within the mining industry, the outsiders may be attracted to the mining industry and expect high salaries because of the belief that minerals from the mines are important for their countries' economy. However, when candidates get employment in the same industry, they may have conditions that keep their payment low. For instance, employers may rationalise to the workers that their salaries may not increase because processing of the minerals before they are in the markets are costly and compel the employees' payment to be low. Being aware of the outlined differences between PTSD and post-traumatic stress, Campfield and Hills (2001) perceive post-traumatic stress disorder as resulting from abnormal responses to the traumatic experience.

Although symptoms may be observable, diagnosticians need to take into cognisance the period between a known traumatic event in the mines, in which the patient was involved, and the time when a victim presented with symptoms. It is for the same reason that Campfield and Hills (2001) note that post-traumatic stress symptoms are a common occurrence immediately following exposure to a traumatic incident. Failure of the symptoms to subside in the first week following the event is predictive of post-traumatic stress disorder at a later stage in the lives of the employees exposed to an industrial explosion.

2.2.2. Stress and Sense of Coherence

Whether stress develops into post-traumatic stress disorder depends partly on the survivor's sense of coherence. Geyer (1997) describes *sense of coherence* as a stable temperament trait found to be a moderator of the stress response. Strumpfer (2003) regards sense of coherence as simply resilience. While sense of coherence plays an important role in determining the manner in which an individual deals with stressful situations and acts as a

buffer against possible burnout, Bloomfield (1998) regards resilience as an ability to "rise above serious loss and adversity – the inner strength to master change successfully" (p. 274). In addition to temperamental and protective aspects of sense of coherence, it also has an environmental aspect. Simonsson, Nilsson, Leppert and Diwan, (2010) postulate that sense of coherence is a way through which a person controls one's environment in order to make a meaningful action. It is a way of viewing the world that facilitates successful coping with innumerable, complex stressors that confront individuals in their daily lives. Based on the description of sense of coherences above, it enhances an individual's ability to appraise a situation and respond in a creative way. Resilience on the other hand relates to the sense of coherence as it is a victims ability to bounce back against difficult situations. There is a great possibility for different individuals to respond differently to similar situations because temperament and resilience aspects of life differ from one individual to the other.

Antonovsky (1983) outlines three components that sense of coherence contains. These components include comprehensibility, which is the extent to which a trauma survivor makes sense of the stimuli he or she experienced. The more comprehensible the experience the more resilient the survivor is expected to be. The second component that Antonovsky regard as important is manageability, which refers to the individual's perception of the availability of resources necessary for coping. This is easily understandable when one comprehends the above definition of stress. If resources are available, an individual is likely to perceive oneself as coping because there is no perceived discrepancy between the situational demands and the necessary resources. The third component of the sense of coherence is meaningfulness. For Antonovsky, this is the survivor's willingness to face the challenges that life offers and to perceive them as worthy of investing energy. An individual with this component does not believe in avoiding the challenges, which is one of the traits people with post-traumatic-stress disorder possess (Marais & Stuart, 2005). Awareness of the sense of coherence and the cautions that one needs to take are important for diagnosticians to define post-traumatic stress disorder appropriately.

2.2.3. Definition of Post-traumatic stress disorder

Kaplan and Sadock (2009) argue that the definition of PTSD has six parts. Firstly, the person must have experienced, witnessed or been confronted with an event involving death, serious injury or a threat to the physical integrity of the self or others. Secondly, the

individual must experience a traumatic situation in the form of distressing images, thoughts, perceptions or dreams.

Reliving an intense psychological or physiological reactivity in thought and dreams may also be present and remind the victim about an event. It is for the same perception that Pillay, Magwaza and Peterson (1992) argue that symptoms of PTSD include hyper-arousal, re-experiencing the traumatic events through intrusive thoughts, dreams, and even re-enactment of the event (Seedat, Duncan & Lazarus, 2001). Thirdly, there must be a persistent avoidance of stimuli associated with trauma and numbing of responsiveness. Fourthly, persistent symptoms of increased arousal should be present since the trauma. Fifthly, duration of the symptom presentation should be at least four weeks and lastly, the disturbance should cause clinically significant distress in social, occupational or other important areas of functioning.

The disturbance in the mentioned dimensions of life and the avoidant behaviour relate with the victim's memory because the victims avoid remembering some aspects of their traumatic experiences. That is the reason for Kaminer (2006) to note that literature conceptualises post-traumatic pathology as a failure of memory and more specifically as a disruption in the conversion of sensory experience to verbal or linguistic memory. Based on this point, it is possible that trauma victims appear as if they do not remember what happened whereas they impulsively avoid talking about what really took place.

Impulsive avoidance that Kaminer (2006) refers to, in the above paragraph, can affect progress of psychotherapy when victims are in consultation. Very few of trauma victims are aware of the importance of telling a comprehensible story during therapy. Kaminer (2006) believes that re-telling and reliving a traumatic event are central to recovery from the experienced trauma. Kaminer further notes that the creation of a linguistic representation of fragmented images and sensory experiences are important in the development of a coherent narrative that names and organises the affects, cognitions, behaviours and sensory experiences that survivors associate with trauma. For Kaminer (2006) this represents a process of recovery for trauma survivors. This avoidance of recalling and re-telling the details of a traumatic event may be subject to misuse by trauma victims.

According to Kaliski (2006), post-traumatic stress disorder is a favourite when claiming occupational disability in most of the occupations with accident-prone scenes. Faking occupational disability is easy for mining employees because practically all symptoms of post-traumatic stress disorder are self-reported and there is no possibility to prove or disprove the existence of the mentioned symptoms. The possibility to fake occupational incapability suggests that although the diagnostic criteria for post-traumatic stress disorder are useful, it is important to use them with caution. It is on these bases that Janoff-Bulman and Frieze (1987) contend that symptoms categorised as meeting the diagnosis of post-traumatic stress disorder are to some extent Eurocentric and culture-bound (Hook & Eagle, 2002). This westernised nature of the diagnostic criteria limits its application to the traditionally African cultures. Ngubane (1977) and Shuttle (1994) argue that traumatised people with traditionally African background present with symptoms such as chest and back pains as well as feelings of faintness or dizziness, which are integral to their distress.

Although the diagnostic criteria seem to have flaws, some theorists understand the physical symptoms of post-traumatic stress disorder. Piaget (1962) notes that when a traumatic experience defies the victim's cognitive categorization, its memory, based on that experience is organised on a more somatosensory level rather than semantic memory level. This understanding presents traditionally African victims as presenting post-traumatic stress disorder with more physical symptoms. Such presentations are not encompassed within the frame of post-traumatic stress disorder diagnostic criteria although diagnosticians have to be open to culturally specific forms of presentation.

Based on the above view, the post-traumatic stress disorder diagnostic criteria have limited applicability to the mineworkers because their majority are African and possibly present with the mentioned non-accommodated symptoms. To improve understanding and good diagnosis using the presented symptoms, there are different factors that need more focus.

Diagnosticians need to understand that as the diagnostic criteria are westernised they are likely to be individualistic. Although workforce within the mining industry is racially diverse, it is common within the South African mining industry that African people get an exposure to traumatic incidents. Poor education and poverty that the majority of African people suffer from, contributes to their concentration in the underground manual labour in the mines, which expose them to accidents. Ngubane (1977) and Shuttle (1994) argue that

the African cosmology holds that all people operate as integrally related forces with animistic links to the natural and spiritual world. Based on this cosmology, African people understand harm and misfortune as a rupture within the whole field of forces representing an imbalance that needs rectification (Hook & Eagle, 2002). This observation shows a need for diagnostic criteria to be developed so that the mining industry, whose majority are African people, can be accommodated. Such an accommodation would have a positive effect to the possible trauma management strategies in the mines.

In addition to cultural understanding, awareness of gender differences can enhance comprehension of post-traumatic stress disorder for the diagnosticians. Janoff-Bulman and Frieze (1987) argue that at the level of gender differences between people of the same class and ethnic origin, there is an observation that men tend to present with more anger following trauma exposure and women with fear (Hook & Eagle, 2002). It is possible for mineworkers to present more with anger because men are the majority in the mining occupation and if there are women in a mining organisation, a minority of them work in a trauma-laden environment such as underground. This mineworkers' anger can negatively affect communication and relationship between them. Unless mineworkers communicate effectively, they can hardly support each other during difficult moments, which is one of the risk factors. The extent of anger depends on the individual worker's personal attributions and feelings regarding the occurred accident.

According to the American Psychiatric Association (2000), individuals with post-traumatic stress disorder may describe painful guilt feelings about surviving when others did not. The same guilt may be about actions that individuals think retrospectively that they should have taken. Mineworkers are likely to experience such feelings when they survive mining accidents. Survivors are likely to question themselves as to why they did not get hurt or die like others.

Besides the guilt feelings that trauma survivors in the mines may go through, there is a possibility for them to experience auditory hallucinations after the occurrence of an accident (American Psychiatric Association, 2000). Such an auditory hallucination may involve hearing noise that an individual may have heard when the mining disaster occurred. Hearing such false sounds, the response becomes the replica of the response that the individual shows if a real traumatic incident happens. According to McKenna (2000),

hallucinations keep coming back because survivors of traumatic accidents in the mines cannot stop thinking, dreaming and having nightmares about mining accidents. There are different factors that make people vulnerable to the development of post-traumatic stress disorder.

2.3. Vulnerability Factors

Many aspects need consideration in assessing the level of vulnerability an individual may have with regard to the development of post-traumatic stress disorder. American Psychiatric Association (2002) posits that severity, duration and proximity of an individual's exposure to the traumatic event are the most important factors affecting the possibility of developing post-traumatic stress disorder. In a similar vain, Shore, Tatum & Volmler (1986) contend that although there is a low correlation between the amount of stress in a traumatic event and the resultant psychopathology, as the intensity of exposure to a disaster increases the number of victims who develop post-traumatic stress disorder increases progressively. The mining industry is a good example of the work environment that frequently exposes employees to traumatic disasters. In view of this argument, it is possible that a trauma has to be of sufficient intensity to force victims to put on their agenda fundamental questions about their self and their relationship to the world.

Whether an individual is vulnerable to the development of post-traumatic stress disorder also relates to age and history of life difficulties. Van Niekerk (1997) holds the same view in the argument that demographic variables such as age, length of service in a mining industry and marital status are associated with lower symptoms of post-traumatic stress disorder (Jones & Kagee, 2005). One may believe that the younger the victim the more likely to experience post-traumatic stress disorder symptoms. It is for the same perception that Kaplan and Sadock (2009) hold that history of repeated traumatization in childhood may produce long-lasting states and adversely affect the individual's interpersonal relationships and development. Helzer et al. (1987) found in one of their studies that behavioural problems before the age of fifteen predicted the post-traumatic stress disorder in the event of trauma. These behavioural problems include, among others, stealing, lying, fighting, substance abuse, academic underachievement and delinquency (Scott & Stradling, 1992).

These behavioural problems may precede disruption of interpersonal relationships and make some individuals unable to relate to people who can be a source of social support, which is also important in the stress management process. As early childhood traumatization interrupts development of an individual, this may influence the use of maladaptive defence mechanisms as a way of coping with the trauma-laden events. In line with this view, Baldwin (1979) argue that defence mechanisms start operating at the moment of birth and continue until the interruption of death. It is likely that defence mechanisms become more mature and adaptive as the individual grows up. It is for the same reason that Kaplan and Sadock (2009) argue that childhood participation in an abusive violence leads to the predominance of denial and numbing, which are examples of immature coping mechanisms. In addition, witnessing similar events as a non-participant observer results in a predominance of re-experiencing the post-traumatic stress disorder symptoms. The negative effects that early childhood experiences have on the child may have similar effects when they happen during adulthood.

The observation that people with longer service history in the mines experience less post-traumatic stress disorder symptoms can mean, on the one hand, that they have developed coping skills through their experience. On the other hand, Jones and Kagee (2005) believe that mineworkers with longer service are likely to be in a higher rank. Higher levels in an organisational hierarchy are likely to preoccupy employees in the mines with increasing levels of administrative duties, which results in less exposure to traumatic events compared to workers of a lower rank and less work-related experience. Others may be in the higher ranks because of their advanced level of educational qualifications and this can limit their experience of working in the environment with traumatic events. Such people would be difficult to categorise on the bases of whether they are using adaptive or maladaptive defence mechanisms.

The possibility to use maladaptive defence mechanisms such as denial and numbing makes a coping style predictive of whether a victim may develop post-traumatic stress disorder symptoms. According to Lazarus (1966), the way a trauma survivor copes with difficult experiences is a present promising predictor of the development of PTSD. In line with this argument, Lazarus distinguishes between two forms of coping, active versus palliative. This simply refers to direct confrontation versus managing one's emotional reactions by maladaptive activities such as taking alcohol or a holiday (Scott & Stradling, 1992). The

maladaptive coping styles are used as avoidant strategies. For example, a trauma survivor may take alcohol in order to escape worries that one feels unable to cope with.

Referring to the above view, escapist drinking is avoidance and has a short-term benefit for its user. On a similar note, Scott and Stradling (1992) argue that avoidance can reduce stress in the short term, "increase hope and allow for short assimilative episodes of grief and distress" (p. 25). However, for Scott and Stradling, the most adaptive long-term response to a trauma is likely to be a "subtle interweaving of problem-focused and emotion focused coping which will match the changing internal and external cues that client experiences" (p. 25). In view of Scott and Stradling's argument, it is important for a trauma survivor to be dynamic and use a variety of coping skills. This may enable the survivor to assess the situation and respond in an adaptive manner that possibly has a long-term benefit.

Whether a trauma survivor responds with adaptive or maladaptive behaviour depends on the individual's family situation. In view of this possibility, Hooley, Orley & Teasdale (1986) believe that the way the recovered depressives fare after their discharge from the hospital much depends on the level of emotions that the family expresses. If the family is over-involved or critical, there is a belief that the relapse is much more likely.

In line with the caution that trauma survivors need to take when they relate to other people, Bloomfield (1998) believe that although victims of traumatic attack should be encouraged to turn to others for support, considerable care should be taken that they choose people they can truly trust. Bloomfield warns that although significant others can be of immense help, it is possible for them to interfere with the survivors' recovery or be dangerous themselves. Based on this argument, it is obvious that although the majority of the significant others may show sympathy towards victims of trauma, it is possible for some of these significant others to have accusatory responses to the victims without knowing that such responses worsen the bad feelings. It is also possible for the significant others to be overindulgent such that trauma victims develop overdependence.

The above association of the social environment with lower level of post-traumatic stress disorder symptoms relate with the importance of the family. The same association may suggest a possibility for trauma married victims to share their negative feelings with their

spouses. Although spouses' and family member's responses may vary, this sharing can enhance a level of social support that an individual may receive. Definition of social support presents it as an "exchange of resources between two individuals perceived by the provider or the recipient to be intended to enhance the well-being of the recipient" (Duffy & Wong, 1996:104).

In view of the possible resourcefulness of the spouses, one may argue that single mineworkers are more likely to experience post-traumatic stress disorder compared to their married counterparts. The role that spouses can play in the lives of trauma victims relates with the role that the size of the victims' family can play. According to Scott and Stradling (1992), it is within the family context that an individual's basic attitudes to life are distilled. Interpersonal feedback constitutes an important environmental influence on thoughts, feelings, and behaviour. Where there is a family history of psychiatric disorders, there is more likelihood for the offspring to adopt a maladaptive set of attitudes. If a family encourages some positive attitudes, it instils adaptive set of attitudes within its members.

Scott and Stradling (1992) confirms the same likelihood by arguing that a pure case of post-traumatic stress disorder is a rarity as PTSD often occurs in conjunction with other affective disorders particularly anxiety and depression. They further believe that headings such as thoughts, feelings, behaviours and physiological effects, which are characteristics of post-traumatic stress disorder, can be part of anxiety and depression. With the same view, Beck and HAAGA (1992) describes thought content of anxiety and depression in terms of the cognitive triad of self, world and future (Scott & Straddling, 1992). Looking at Beck's anxiogenic cognitive triad, one may readily see an association between anxiety disorders and post-traumatic stress disorder, as they are both in Axis I. Majority of the victims of these disorders usually have difficulties in their social structures.

As one of the vulnerability factors, Kaplan and Sadock (2009) regard lack of social support as a pre-existing risk factor and add that this becomes more risky when trauma victims separate themselves from their social support networks. It seems likely that an individual without social support is both more vulnerable to the effects of trauma and more at risk that some conditions can maintain the distress. In line with the same view, Scott and Stradling (1992) posit that support is not something that one can simply provide to a client. However, the clients' trauma beliefs may greatly influence the extent to which they regard elements

of social network as sources of support. It is clear that the victims' subjective perception of the source of support seems to buffer the negative effects of a traumatic event on the survivor. If a mineworker regards colleagues and management in the mining industry as supportive, psychiatric disorders like PTSD may develop to a lesser extent

It is possible for psychiatric problems to have a genetic factor. This likelihood makes a psychiatric problem pass from one generation to the next within the same family. To support this argument, Kaplan and Sadock (2009) posit that from epidemiological and treatment-seeking samples, a family history of psychiatric illness in general and of anxiety disorder in particular, are the additional premorbid factors to the development of post-traumatic stress disorder.

2.4. Possible Causes of Mining Accidents

Literature indicates that South African mining industry has to compete on the world markets with modern open cast mineral production that foreign countries use. This competition makes mine managers prioritise on output rather than safety of the employees (Slaughter, 2007). The employees' awareness that they have to compete with the world market can cause pressure on them. According to Naude & Rothmann (2006) employees working in an environment with different stressors are at risk of injury, cardiovascular diseases and other health problems including psychological health disorders and burnout. Job burnout is more than job stress and occurs when a person believes that he or she cannot or will not continue to do the job.

Burnout differs from stress in that a stressed person can take an extended leave and return rested and ready to get back to work. However, if a person has experienced burnout, within a few days after returning to work he or she will feel as miserable as before the vacation. Burnout is simply the overall perception that one is giving more than he or she is receiving and takes place at all organisational levels and all working age groups (Carrel, Elbert, Hatfield, Globbler, Marx & van der Schyf, 1996). As there is an association between burnout and accident proneness and the observation that burnout takes place regardless of the mentioned aspects, it is possible that anyone in the organisation can be involved in an accident regardless of an experience.

It is possible for stress and burnout to be caused by the coping strategies that a victim uses. Carrel et al. (1996) argue that work conditions may create an environment that leads to frustration, anxiety and stress. Depending on the availability of the useful resources and the way an employee feels, it is likely for some employees to seek relief through alcohol intake or other addictive chemicals. Although intoxication can be useful for employees to cope with work-related pressure and difficulties, there are many chances for it to cause accident because there is an association between intoxication and poor judgement, which causes accidents in an occupational environment.

In addition to the pressure that competition exerts on the employees within the South African mining industry, strategies that the employees use to dig minerals cause accidents. According to Slaughter (2007), minerals in the mines are reached through blasting, which destabilises the overhead roofs and creates a constant danger of rock falls. When the blasting takes place, the whole place shakes such that even the neighbouring places shake and the rocks become lose and fall unexpectedly. Besides the impact that means of production, in the mines, have on mineworkers' proneness to accidents, discomfort in the mining working environment adds to traumatic experiences.

According to Carrel et al. (1996) inadequate ventilation and airborne contaminations that the means of mineral digging cause are some of the factors that contribute to the traumatic events in the mines. Usually, there is only one way for the mineworkers to go to and from underground and they dig for long distances. If the entrance is away from where the mineworkers are digging, this can possibly affect air circulation and cause discomfort to the mineworkers. This discomfort can be dangerous to the mineworkers because there are lethal gases used for blasting that are dangerous to inhale in large amounts. The long distance between the underground entrance and the place where the digging is taking place can contribute to the severity of the accident because it would take time for the workers to escape the trauma.

Slaughter (2007) makes an example with methane as one of the gases useful for blasting. For Slaughter, methane gas has to be used with caution because it is deadly and lighter than air. This lightness of methane gas makes it high overhead and difficult to detect in a haulage area. In the mining industry, broken fans, used for underground air circulation, usually cause the build up of the dangerous gases.

Some measures need to be in place to manage air circulation and limit mining accidents because a gas can leave mineworkers with chronic chest problems. This can be a loss to an organisation because a productive and an experienced worker can take an early retirement because of diseases that a poor working environment causes.

2.5. Proposed Accident Management Strategies in the Mines

In the process of developing strategies of managing accidents in the mining industry, it is important to be aware that there is a distinction between natural and man made disasters. Within the mining industry, natural disasters include among others earthquake, epidemics and floods. Man made disasters involve labour unrest in the mines, bomb blasts and fires (Swanepoel et al., 2003). Whether an accident is natural or man made influences the way of intervening in order to prevent and manage it appropriately.

Within the mining industry, there are different bodies that are in charge of safety of mineworkers to limit the accidents that may result in post-traumatic stress disorder. Terblanche (2007) believes that the Chamber of Mines facilitates the development of such safety bodies. One of such bodies that Chamber of Mines initially put into operation is Care of Pressurized Employees program (COPE). Terblanche (2007) contends that a relatively large number of mineworkers who are continuously experiencing some degree of post-traumatic stress disorder due to high incidence of injuries and deaths resulting from previous mining accidents brought to the inception of the COPE programme.

Badenhorst and Van Schalkwyk (1992) regard COPE as responsible for assisting mineworkers to cope effectively with demands and pressures that adversely affect quality of work, health and productivity following a traumatic accident. They further believe that COPE provides early access to professional care to the employees who have difficulties in coping with the effects of trauma (Terblanche, 2007). This description of COPE suggests that it would work cooperatively with EAP, discussed in the next section, if they are within the same occupational environment.

Safety bodies work cooperatively with different occupational acts that play a role in the management of mining accidents that mineworkers regard as contributing to the prevalence of post-traumatic stress disorder within the mines. One of these acts is Occupational Health

and Safety Act, No 85 of 1993 (OHSA) (Carrel et al. 1996). According to Carrel et al. (1996), this act lays down certain rules aimed at preventing accidents in the working environment. The same act is also important for the provision of health and safety of persons at work as well as those in connection with the use of plant and machinery that mineworkers use in the digging process. Within the mining industry, it is often expected that loose rocks can fall off unexpectedly. This makes the wearing of the hard hats inevitable to avoid rocks from falling onto the mineworkers' heads.

Occupational Health and Safety Act, No 85 of 1993 (OHSA) further protects mineworkers from hazards to health and safety caused by the activities of their colleagues at work. Machines with large noisy engines are mostly used in the digging process in the mines. This noise is likely to have a negative effect in the auditory functioning of the miners who work closely to such machinery and the operators. The rule that Occupational Health and Safety Act may need the workers to adhere to would be the wearing of the sound blocking devices to prevent auditory damages. The mining industry uses the same act to establish an advisory council, which represents the interests of the employers and the employees in relation to the application of the act.

Representation of the interests of employees and employers make intentions of the Occupational Health and Safety Act work conjunctively with the Mine Health and Safety Act. Swanepoel et al. (2003) regard the Mine and Safety Act as promoting cooperation and consultation on health and safety between the state, employers, employees and their representatives. The involvement of the state can enable employers and employees' representatives to work together with the minister of labour. This cooperation can assist in making sure that the policies of the mines are in line with the labour law and the constitution of the country.

Both of the above acts work cooperatively with the National Occupational Safety Association of South Africa (NOSA). This association aims towards promoting the prevention of the occupational accidents as well as diseases. In addition, it endeavours to eliminate causes of the accidents and diseases and their negative impact in the commercial and industrial sectors of the South African country. The same association acts as a national body in promoting and encouraging occupational safety and health as well as carrying out occupational safety and health publicity. NOSA further deals with all matters and questions

pertaining to occupational safety and health. It even acts as a general advisory body on all occupational safety and health matters (Carrel et al., 1996).

All mineworkers need to know this act because their knowledge will facilitate the mineworkers' ability to evaluate themselves and one another whether their activities are in accordance with the prescribed rules. If there are rules to follow at work, it becomes easy for investigators to find out about causes of accidents if they happen in the mining industry. Finding the cause of an accident possibly initiates measures of preventing that accident from taking place at a later stage.

Besides the occupational acts that establish the mining rules, it is useful to have emergency facilities to use when a traumatic accident strikes. Swanepoel et al. (2003) contend that each mining employee should receive very basic, introductory first aid training. Further, it is important for the mining industries to have emergency infrastructure. This infrastructure should include the necessary first aid facilities such as first aid room and first aid equipment and material. Certain employees have to be designated as first aiders and they should receive special training in the first aid. Swanepoel et al. (2003) believe that outside experts should train the elected employees particularly if the mining industry in question does not have internal expertise.

Training of the elected employees can assist in making sure that the ordinary support systems for both the organisation and mineworkers are intact and fully functional. Terblanche (2007) observes that most of the individuals involved in traumatic accidents exhibit no immediate stress reaction because the major and minor incidents in the mines occur unexpectedly. This delayed response necessitates a proactive intervention programme to train personnel managers at various mining sites so that they can intervene regardless of whether the symptoms are observable or not. These managers would be able to follow up after accidents and identify mineworkers involved as well as those in the periphery.

Interventions can be primary, secondary or tertiary depending on a context. Primary intervention attempts to prevent a problem from occurring. A proactive intervention implicated in the previous paragraph would serve as a primary intervention. Secondary intervention attempts to treat a problem at the earliest possible moment before it becomes

severe or persistent. In this context, such intervention would follow soon after a traumatic accident has happened. Referring to the description of PTSD and stress in chapter one, secondary intervention would treat symptoms of stress and prevents it from developing into PTSD. Tertiary intervention belongs more in the realm of clinical psychology and attempts to reduce the severity of a problem once it has persistently occurred (Duffy & Wong, 1996). In the mining industry, tertiary intervention may include, among others, relocating the victims to the jobs that trigger traumatic feelings to a lesser extent, and compensation for injuries. Swanepoel et al. (2003) view compensation for injuries and diseases as important in terms of the Occupational Diseases in Mines and Works Act (ODMWA).

At a secondary level, Terblanche (2007) believes that mining supervisors' training is important for their ability to recognise symptoms of mineworkers who may be suffering from post-traumatic stress disorder. They believe that this training is important for making appropriate professional referrals. Such referrals may need proper screening because although different people may all fall sick because of an involvement in a similar traumatic incidence, their problems may present at different levels and through different ways. Other individuals may need attention of medical practitioners, psychiatrists and psychologists for psychotherapy. As it can be difficult for the supervisors to be clinically equipped, it is likely that they can recognise mineworkers suffering from post-traumatic stress disorder symptoms using their routine work performance evaluation rather than conducting formal clinical assessment.

In addition to the training that elected individuals may obtain, it is important for most of the mining industries to establish adequate contingency plans to cater for the employees' safety and health (Swanepoel et al., 2003). As the elected individuals will serve as the emergency controllers, they will take a responsibility of drafting the emergency plan and organising emergency training for others.

Swanepoel et al. (2003) argue that for the elected individuals to handle the mentioned responsibilities effectively, they must have a plan of the whole site together with the floor plan of the buildings indicating all the entrances. The floor plan has to indicate the main electricity boards, hazardous substances, inflammable materials and gas cylinders. The floor plan chart must indicate the location of emergency equipment such as fire extinguishers, first aid boxes and emergency equipment including rescue equipment,

addresses and telephone numbers of all emergency personnel and effective communication systems (Swanepoel et al., 2003).

The mentioned devices are very important in the mining industry because light is very poor underground and it is usually located where the production is currently taking place. All other places including the way leading to the entrance and exit of the tunnel are dark and this makes the emergency evacuation process difficult.

The severity of the accident that needs attention would assist in deciding whether the specially trained individuals or any employee with basic first aid training has to intervene in response to the occurred traumatic accident. Most of the intervention procedures are facilitated through the employee assistance programme (EAP) that most of the South African organisations have.

2.6. Employee Assistance Programme (EAP)

It is Terblanche's (2007) view that South Africa has well-developed systems of employee assistance programme. Carrel et al. (1996) argue that the employee assistance programme began a few decades ago when employers in different industries began to recognise work place related problems. Although this programme was initially planned for workers with problems related to alcohol abuse, it presently has a broader attention and a comprehensive approach. EAP presently assists employees with identifying and solving their personal problems regardless of their causes.

The typical employee assistance programme addresses psychological and physical problems (Carrel et al., 1996). This enhances its applicability to the problems that result from mining traumatic accidents because in most cases the traumatic accidents leave victims with physical injuries. The severity of such injuries leaves victims with psychological problems that possibly result from knowledge that they will remain with permanent disability, which is mostly difficult for victims to accept.

Further, although the initial aim of establishing EAP was at alcohol problems, it has relevance in the mining industry because some mineworkers may use drugs as an attempt to forget about their work-related felt difficulties. They use drugs besides the observation that their benefits are short-term. It is because of the same perception that Terblanche

(2007) regards these programs as adept at handling trauma resulting from trauma-laden events that seem to be frequent in most of the mining industries.

Swanepoel et al. (2003) contend that one aspect that needs closer consideration is whether to opt for internal or external employee assistance programs. The internal employee assistance program refers to the assistance that originates within an organisation through employee assistance practitioners. Employees employed as EAP practitioners have an advanced level of EAP training and assist other employees within the same organisation if they have work-related difficulties. Carrel et al. (1996) regards internal employee assistance programmes as expensive for single employer to use and they are found mostly in large organisations. Although the internal model may sound easily accessible and cost-effective to the organisations' employees, it has some flaws that relate to confidentiality particularly in the eyes of its potential users (Swanepoel et al., 2003) and because of the similar ethical flaws, users can shy away from using it.

The external employee assistance programmes on the other hand are obtained when an organisation receives expertise from external professionals. Although the external EAP model may be more expensive, its aspects of credibility and confidentiality may be viewed more positively in comparison with an internal employee assistance programme.

Carrel et al. (1996) argue that one of the reasons to increase and sustain the company-sponsored EAP is the observable companies' profitability achieved through the reduction of traumatic accidents and medical claims using the programme. This observation makes the EAP use beneficial for both the employees and the employers.

Reduction of traumatic incidents benefits the company because it would face less medical claims that are due to the involved employees. In addition, the employer would be free from paying compensation funds that employees may need as a result of a horrific mining incident. Employees on the other hand benefit from such a reduction because their exposure to traumatic incidents can leave them with injuries, loss of their ability to maintain their occupations and possible retrenchment. Terblanche (2007) notes that EAP practitioners assist the disabled workers by relocating them into new job responsibilities such as cutting and stitching miners' overalls and making tracksuits for the mining house

sport teams. These are the occupations that mineworkers regard as less stressing compared to the occupations in which an accident may have occurred.

Although internal relocation can be viewed as being considerate of the involved employees it can also be stressful because if an employee is allocated to another position, it is likely for the new position to pay less than the old one. This situation can affect the involved employees' lifestyle negatively, which may keep them haunted by thoughts related to the same traumatic incident.

Although EAP practitioners are the first people to intervene when there are post-traumatic stress disorder cases, complications of these cases may need a further referral to get some specialised trauma-related symptom management. The following are different kinds of interventions for which EAP practitioners can make referrals.

2.6.1. Debriefing

Debriefing is one of the approaches for the management of PTSD and it is designed to facilitate normal recovery process and assists victims to come to terms with their traumatic experience (Campfield & Hills, 2001). Referring to the description of debriefing, it facilitates the victims' ability to adjust to occupational daily routines after going through some traumatic experience.

The length of time that must lapse between a traumatic incident and debriefing time is still debatable. It is for the similar uncertainty that Paton (1995, as cited in Campfield & Hills, 2001) identified four types of debriefing, which include **On-scene** debriefing, which is aimed at providing support during the incident. In the mining industry, the debriefing practitioners need to be underground so that they attend to the victims while they are on the place of the accident. Although debriefing can be obtained from external experts, on-scene debriefing is easy to be provided by the practitioners employed by the organisation in question. There is also **post-incident defusing**, which allows a victim to ventilate one's feelings in the hours immediately following the incident. Description of post-incident defusing seems beneficial in that it limits the bottling up of the pain, which is usually a problem at a later stage in the victim's life. Further, there is **educational** debriefing, which Paton regards as important for providing information about the post-traumatic stress experience. When victims of a traumatic experience get educated by professionals or other

victims who have been in a similar situation previously, they can be able to evaluate the extent to which they have been affected. Sharing of the information can also facilitate ventilation referred to under post-incident defusing. **Psychological** debriefing aims at promoting understanding, acceptance and normalization of victims' reactions. It alleviates the initial distress and seeks to prevent the later development of chronic post-traumatic stress disorder for mineworkers. Referring to the differentiation of post-traumatic stress disorder from post-traumatic stress in section 2.2 above, psychological debriefing prevents post-traumatic stress from extending into post-traumatic stress disorder. This debriefing has grown it its popularity since 1970's and psychologists apply it in a variety of situations, including traumatic experiences in the mining industry (Campfield & Hills, 2001).

Different models are likely to be used depending on the contexts of their application. Mitchell (1983) recommends Critical Incident Stress Debriefing (CISD) as a widely used model to assist service personnel frequently exposed to trauma. Everly, (1995); Everly & Mitchell (1999); Parkinson (1997) argue that this model has been used effectively in high-risk occupational groups (Campfield & Hills, 2001). CISD is a formal process and has seven phases that define it.

Critical Incidence Stress Debriefing model starts with an *introduction* in which the debriefing team introduce themselves and explain the purpose and process of debriefing. This precedes the *fact phase*, which allows each participant in the group to describe his or her position and role during the traumatic incident. Exploration of the first thought each person had during the incident follows and this is the *thought phase*. After thought exploration, the process focuses on the emotional reactions and feelings of the victims and this is referred to as *reaction phase.* The *symptom phase* follows in which the cognitive, physical, behavioural and emotional symptoms, the victims experience since the incident, are a focus. The debriefing team then presents a *teaching phase*, which is a normalising process, using a cognitive approach where the role players provide the victims with the information on normalcy of their distress reactions, ways to manage them and further reactions to expect. In the final *reentry phase*, debriefing team invites questions, clarifies certain issues and conclude with the summary of the whole debriefing process (Campfield & Hills, 2001).

Although debriefing may vary on the length of time it takes, Mitchell and Everly, (1995) believe that debriefing may take two hours in excess and contend that it ideally takes place between 24 and 72 hours after the incident. Up to 12 hours after the incident and ideally three to eight hours, they recommend a defusing process that is similar to debriefing but shorter and less structured, with the phases of introduction, exploration of the experience and information provision (Campfield & Hills, 2001).

Although contexts, where Critical Incident Stress Debriefing (CISD) is applied may differ, Campfield and Hills (2001) believe that CISD is effective immediately after a mining traumatic incident compared to its delayed application in the same context. Besides the lack of consensus whether the immediate or delayed intervention is more effective than the other, the mentioned quality of the CISD relates to the view that the principles to follow in treating post-traumatic stress disorder include immediacy and proximity.

According to Terblanche (2007), immediacy is the rendering of trauma management that needs to be rendered as soon as possible after the mining critical incident has occurred. Proximity is the situation where support should be provided as close as possible to the disaster scene by using individuals from normal support systems such as family, friends, core workers or supervisors to render the necessary bio-psychosocial assistance (Terblanche, 2007). This nature of the intervention necessitates colleagues and family members of the mining accident survivor to have basic skills of intervention so that they do not trivialise or exaggerate the situation compared to its real state.

Immediacy and proximity of the CISD model makes its application comparable to the way crisis intervention works when intervening on a mining accident. According to Kaplan & Sadock (2009) crisis intervention is important in the immediate aftermath of a trauma and may reduce the opportunistic development of chronic post-traumatic stress disorder or any other complications.

Stein and Eisen (1996) believe that when trauma occurs at work, the short-term crisis intervention assists employees return to work sooner and reduces absenteeism and financial loss to the business (Campfield & Hills, 2001). If there is no time that lapses between a traumatic event and the intervention within the mines, the avoidant behaviours of the incident survivors become easy to challenge. Almost resembling the phases of the CISD

model, treatment in the crisis intervention is geared to the establishment of support, promotion for acceptance of what happened, provision of education and information as well as attending to general health needs of a victim.

Debriefing and crisis intervention in the context of the mining industry can be important for both individual and group interventions, although this may depend on the observed needs of the victims. Victim's unique traits such as sociability and self-centeredness within the mining industry contribute to the possibility for the victims to suffer from post-traumatic stress disorder. If a victim is sociable, one would be easy to work with and benefit from sharing the trauma experience with other people like in a group setting. If an individual is characterised by self-centeredness, one would benefit more from individual therapy sharing a trauma experiences with a therapist. In addition to determining whether a victim may benefit from an individual or group psychotherapy, these strategies can both be applied and used as sources of coping for different trauma victims.

Folkman, Lazarus, Gruen and Delongis (1986) refer to coping as "the person's cognitive and behavioural efforts to manage the internal and external demands of the person-environment transaction that is appraised as taxing and exceeding the person's resources" (p. 211). Baldwin (1979) relates coping with the concept of homeostasis, which he regards as borrowed from physiology and defined by the need to preserve stable chemical or *electrolyte* within the body necessary to maintain life. For Baldwin, coping represents psychological self-regulatory mechanisms that trauma victims use to facilitate the mentioned homeostatic balance.

Coping can be differentiated into problem-focused coping, which comprise interpersonal efforts to solve problems and engage with stressful situations effectively. Moos (1993), regards problem-focused coping as reflecting cognitive and behavioural efforts to master or resolve life stressors. Another type of coping is emotion-focused coping, aimed at reducing stress and regulating emotions (Jones & Kagee, 2005). With reference to the mentioned types of coping, an individual's psychological part is utilisable when one uses emotion-focused coping mostly obtainable in individual therapy. Baldwin (1979) believes that at best, coping is the process of mastery of a particular problematic situation and at worst, coping behaviours serve primarily to protect a vulnerable sense of self without mastering that challenging situation. Referring to the aforementioned dimensions of coping, it is

arguable that problem-focused coping is at best and the emotion-focused coping forms part of coping but at worst.

Although coping mechanisms can be perceived as either best or worse, Baldwin (1979) discourages their dichotomization into adaptive and maladaptive. This author believes that coping is better understandable when one looks at it as a continuum of behaviours manifesting various levels of adaptiveness depending on the person and the situation. This view of coping is suggestive of a need for trauma survivors to have a variety of coping styles because if one style is useful in one situation, it does not mean that it can be functional in all challenging situations that an individual comes across.

There is a possibility for the mentioned view of coping to be originating from Baldwin's (1979) perception that when the individual encounters a situation in which there is significant psychological threat and great personal vulnerability, coping behaviours are more likely to be self-protective than orientated towards mastery. Not to aim towards a mastery feeling is important for safety in the context of the mining industry because a sense of mastery can cause workers to take things for granted and with limited caution. However, it is observable that emotion-focused coping, which Jones & Kagee (2005) refer to above, is more applicable in the in individual therapy for a victim of post-traumatic stress disorder. The problem-focused coping needs a victim to use his or her social being, which is of value in the context of group therapy. Both individual and group therapy discussions will follow respectively below.

2.6.2 Individual Psychotherapy

Individual psychotherapy may follow different approaches depending on a therapist's understanding of the mineworker's problem. Individual therapy has different benefits one of which is emotional catharsis. Catharsis refers to the process whereby a patient "physically and verbally expresses strong emotions while mentally re-living an early traumatic experience" (Kaminer, 2006, p. 484). Although different authors recommend the cathartic method, Kaminer (2006) perceives it as more effective when it is applied in conjunction with cognitive processing. Kaplan and Sadock (2009) have a similar view as they note that therapists provide individual trauma-focused psychotherapy as a time-limited series of exposure-based behavioural and cognitive therapeutic process.

Brannon and Feist (1992) argue that within the cognitive therapy approach roots analysis of the survivor's problem behaviour to reveal a pattern of irrational or catastrophic thoughts underlying the behaviour. This simply implies that thoughts play an important role in the development of a behavioural problem. When the therapist has identified the irrational thoughts, it becomes easy to attack such beliefs with the intention of eliminating or changing them into ones that are more rational. For example, a therapist may realise that a mining trauma survivor always anticipates that another traumatic incident will occur. A therapist may ask for a pathway that leads to such a belief in a process of challenging the survivor's catastrophic thoughts.

There are important aspects involved when the focus of therapy is on the behaviour modification. Bloomfield (1998) believes that cognitive-behaviour therapy strategies consist of the recognition and naming of symptoms. In addition, the process includes daily logs to chat symptoms and adaptive responses, the implementation of manageable *homework* assignments and specific comprehensive safety plans at home, when travelling and at work. Kaminer (2006) recommends the same therapy technique and argues that one of its important aims is to identify and explore the maladaptive beliefs and assumptions that are contained within the survivor's trauma narrative. Based on the possibility of identification and exploration of maladaptive beliefs, a therapist can use cognitive-behavioural therapy to fight the catastrophic thoughts likely to develop into avoidant behaviours within the individual trauma survivor.

Bloomfield (1998) agrees with Kaminer (2006) regarding the indispensability of the trauma narrative in treating trauma related difficulties. This author argues that as recovery from a traumatic attack proceeds, the survivor needs to find ways to tell the story of the experienced trauma, completely, in depth, and with detail. Bloomfield (1998) regards this grief work as particularly important for integrating the traumatic memory into the survivors' life story.

While sharing the story, cognitive behaviour therapy may assist the mining accident survivor to develop and incorporate alternate explanatory accounts that are more realistic and adaptive into his or her trauma narrative (Kaminer, 2006). Kaminer adds that one of its useful components is the imaginal exposure of a trauma survivor to his or her trauma-laden memories of the event. For Kaminer, exposing a survivor to the memories of their

traumatic experience serves the purpose of habituation, which entails exposing a client to a feared stimulus repeatedly until the physiological anxiety associated with that stimulus is reduced. In most contexts, trauma memory is the feared stimulus because survivors associate it with danger.

Closely related to cognitive behavioural therapy is the provision of a brief time-limited course of stress-inoculation training. Blanchard and Ahles (1990) view stress inoculation training as one of the developed cognitive therapies and as a combination of different therapies that include muscle relaxation, thought stopping, breathing control, communication skills and guided self dialogue consisting of cognitive restructuring. In the restructuring process, therapists modify the patient's thinking, beliefs about the self, world and client's future. This technique works like a vaccination by introducing a weakened dose of a *pathogen*. In case of post-traumatic stress disorder, pathogen is an identified stressor (Brannon & Feist, 1992). This approach is effective in a controlled treatment trial of chronic post-traumatic stress disorder (Kaplan & Sadock, 2009). A therapist needs to use this approach with awareness of a level of stress with which a survivor of a mining accident can cope to avoid flooding, which can have negative effects.

Further useful in individual therapy to treat post-traumatic stress disorder is implosive therapy. Kaminer (2006) argues that the technique of direct exposure to a traumatic scene, which is part of implosion, has been frequently employed in the treatment of post-traumatic stress disorder among Vietnam veterans. Kaminer mentions that this method begins by letting the client manage one's anxiety through relaxation exercises and visualisation. Thereafter, the therapist together with the client prepares a written description of the traumatic event including a factual account together with emotions and meaning constructions. The client then narrates the script to the therapist in the present tense and the therapist encourages his or her client to express one's feelings. For Kaminer, the therapist repeats the same process for an average of 12 to 14 sessions. Rothbaum, Meadows, Resick & Foy (2000) contend that the controlled outcome studies of the effectiveness of direct exposure therapy suggest that it reduces post-traumatic stress disorder symptoms.

Implosive therapy is a more intense approach and a therapist needs to be aware that the survivor in question meets the prescribed criteria. The criteria include the survivor's ability to tolerate intense levels of emotional and physiological arousal as well as reactivity to

clearly defined trauma-laden memories. It is also important that a victim is highly motivated, able to produce imagery and has none of the AXIS I disorders (Kaplan & Sadock, 2009) other than post-traumatic stress disorder. Referring to the description and the application of the implosive therapy, one may argue that it needs a certain level of the trauma victim's psychological development and the insight of the referral problem.

The process in which the above individual therapy approaches work, have related features with systematic desensitisation. This is a graded exposure mostly beneficial in overcoming phobic avoidance related to trauma. In using this approach, a mining accident survivor would have a gradual exposure to increasing levels of fear in order to achieve habituation at each level. Like other therapy approaches, systematic desensitisation is a time-limited treatment measure and can be either *in vivo* or imagined in its application. It would be easier for therapists operating on the site of a mining organisation to use systematic desensitisation because a therapist would take a mining accident survivor to the underground as part of the in vivo therapy. The only characteristic that differentiates time-limited exposure therapy from systematic desensitisation is that exposure therapy does not aim at desensitising the trauma survivor to anxiety for all dangerous situations. However, in the context where the client has exposure to ongoing trauma in his or her surrounding, the counsellor should assist the client in developing some adaptive strategies of recognising real threats and protecting oneself appropriately (Kaminer, 2006). Understanding the level of a real threat can prevent its disproportionate perception by survivors.

A closely related desensitising technique that therapists can use with trauma survivors is eye movement desensitization and reprocessing (EMDR) (Bloomfield, 1998). Using this technique, the therapist instructs the patient to recall a traumatic event while performing a rapid eye movement back and forth. The users of EMDR believe that it helps the brain of the patient *metabolise* his or her painful memories. If the client manages to think back to the time when trauma took place this facilitates the therapist's decision making regarding what to focus on.

Although most of the therapeutic interventions are useful, they may have flaws that may possibly have latent results and can be counterproductive. It is for the same perception that Campfield and Hills (2001) view therapy as having a potential of increasing levels of post-traumatic stress disorder symptoms especially intrusive thoughts and avoidance of a

traumatic incident. Kaminer (2006) is also aware of the same flaws of therapy approaches and adds that re-telling of a trauma story in therapy can create a risk for retraumatization of the survivor. This indicates that practitioners must be able to identify the processes of trauma narrative that facilitates the survivors' recovery from their trauma. As one of the ways to counteract these possibilities, Kaplan and Sadock (2009) believe that therapist can ameliorate these flaws of therapeutic approaches by using phase-oriented approach, which is a much-used model of treatment. They believe that the overwhelming intrusive thoughts are counteracted by structuring whereas the avoidant and numbing tendencies are met with procedures to minimise such behaviour.

When a phase-oriented approach is used, Kaplan and Sadock (2009) argue that a therapist must establish a safe therapeutic alliance with a survivor. This alliance will facilitate the meaningful integration of trauma into the survivor's life schema and towards the reduction of distressing intrusive and avoidant phases of post-traumatic stress disorder. Therapist can facilitate the integration of trauma through supportive techniques. Barber, Stratt, Halperin and Connolly (2001) posit that although therapist from different traditions can make use of supportive techniques, these techniques are particularly useful in the reduction of anxiety. In addition, similar techniques promote improvement in the patients' functioning. The view that Barber et al. put fourth suggest that during therapy session, a therapist needs to be selective of the comments and focus on those that facilitate recovery in patients. Some of the techniques that therapists use in the individual therapy can be used in a group therapy context.

2.6.3. Group Therapy

Although there is a great possibility for mining trauma survivors to benefit from individual psychotherapy, group therapy is also beneficial. Further, there are difficulties that one can associate with individual therapy such as its difficulty to access and possible difficulties a patient may encounter in relating to an available therapist. For example, it would be difficult to believe that a therapist employed and working within a company would maintain confidentiality and respect for a colleague's privacy. A therapist may have an ethical challenge such as unavoidable dual relationship with some of the staff members. Kaplan and Sadock (2009) support group therapy in their contention that fellow trauma survivors can provide mutual understanding and support to one another. There is belief that the patient may need long-term supportive therapy that does not only accepts the

limitations imposed by post-traumatic stress disorder but at the same time maximises those adaptive behaviours and coping skills unique to that patient (Kaplan & Sadock, 2009). They further believe that the group situation facilitates the processing of the intense affects that a group can generate. There is a possibility for group therapy to have a greater effect on the avoidance and numbing symptoms compared to the drug treatment and individual therapy.

Group therapy provides the opportunity for survivors to empathise with each other particularly because they share the same information regarding the way the incident happened. Kaminer (2006) believes that the presence of an empathic witness is essential for recovery from trauma because trauma usually "disrupts the link between the self and empathic other" (p. 489). Sharing the same understanding of the way an accident occurred can be facilitated by using a psychodynamic paradigm, which is more effective when victims have problems to relate to others. Jones and Kagee (2005) contend that within the psychodynamic paradigm roots a popular assumption that discussing trauma-related aspects such as feelings and thoughts with others is likely to aid their resolution. Placement of the emphasis on catharses by means of verbal articulation of the traumatic memory is important within the same paradigm (Jones & Kagee, 2005). Although therapists can use psychodynamic therapy in individual therapy, it is also applicable in group therapy because a therapist may observe the way a client communicates with other group members in the group, which possibly imitates a real life situation of the client.

What a survivor perceives as difficult to share in an individual therapy can be shared in a group context using psychodynamic paradigm. According to Kaminer (2006), in a group context following a psychodynamic framework, group members assist one another in the development of an explanatory narrative regarding a traumatic event. This narrative is developed through the mutual exploration of the unconscious processes that influence emotions, thoughts and behaviour. The whole process is valuable for each client to fill out the plot of his or her traumatic story. In the process, the unconscious and destructive meaning that a client has gradually comes into the conscious verbal narrative of his or her traumatic experience. For Kaminer, the discovery of the unconscious meanings provides an explanation that enables the client to link earlier events causally with current experiences, which fills the narrative gap of unrelated events.

Depending on the intensity of the symptoms, the above points may be indicative of the usefulness of the group therapy to either complement or supplement other therapy techniques that an individual therapist may be comfortable of applying. Intensity of post-traumatic stress disorder symptoms usually differ from one patient to the other. Sometimes neurochemical and psychophysiological changes accompany chronic post-traumatic stress disorder. These changes are distressing and lead to different levels of psychosocial dysfunction. An extreme level of symptom intensity may preclude the effect of trauma-focused therapy. Neurochemical changes may necessitate the use of medication (Kaplan & Sadock, 2009).

2.6.4. Pharmacotherapy

Although medication is effective in managing post-traumatic stress disorder, Kaplan and Sadock (2009) are worried by the lack of indications for effective antipsychotic treatment for the same disorder. This contributes to the importance of multimodal therapy interventions.

Besides the mentioned difficulty with regard to antipsychotics, trycyclic drug therapy with amitriptyline or imipramine often remains the most established form of effective treatment. These drugs are specifically effective on core intrusive features of post-traumatic stress disorder symptoms (Kaplan & Sadock, 2009).

Different drugs differ in their efficacy depending on the severity of the presenting symptoms. Kaplan and Sadock (2009) recommend that the efficacy of the treatment drugs be expected at least after a period of eight weeks when a patient presents with chronic post-traumatic stress disorder symptoms.

Although most of the drugs may have positive effects in the treatment process, it is important to note that very few of them work without leaving any side effects. Kaplan and Sadock (2009) believe that although most of the studies attest to the value of phenelzine in treating post-traumatic stress disorder, its side effects are most problematic. Different drugs take wide-ranging differences in mechanism and this makes it important for a clinician to learn more about the unique advantage of each drug in post-traumatic stress disorder (Kaplan & Sadock, 2009). This awareness will enable a clinician to weigh side effects against the observable benefits in a treatment process. Although pharmacotherapy is useful

in handling neurochemical and physiological symptoms of post-traumatic stress disorder, relaxation training further assists in the management of physiological symptoms.

2.6.5. Relaxation Training

Relaxations training is the simplest and easiest of all psychological interventions that therapist can use in the management of post-traumatic stress disorder in the mines (Brannon & Feist, 1992). Perhaps what contributes to the advantages of this technique is its possibility for the survivors to use without therapists when they need to be in a relaxed state. As this technique focuses on the physical part of the victim, therapists start by giving a rational to their clients for using this procedure. According to Jacobson (1938) the explanation includes the perception that their tension is resulting from their tense muscles. During a therapy session, therapists ask their clients to breathe deeply in and then exhale slowly after which a deep muscle relaxation exercise begins. Trauma survivors must have a sense of how relaxation feels, and they do it by tensing a particular muscle group, hold the tension for ten seconds and they have to release it slowly. Then trauma survivors have to release the tension slowly, concentrating on the relaxing, soothing sensation in their hands as tension gradually drains away. Once trauma survivors finish dealing with a group of muscles that have been focused on, they go to another group of muscles and follow the same procedure.

The idea that patients have a role to play in their therapy process develops **self-efficacy** in them. Self-efficacy refers to the patients' confidence that they can perform the behaviours necessary to produce the desired outcomes (Brannon & Feist, 1992) in this context, they aim towards a relaxed state. The role that patients play enhances the sustainability of the positive changes that patients may achieve when they are assisted by psychotherapists.

This chapter has managed to outline theories around post-traumatic stress disorder and differentiated post-traumatic stress disorder from simple stress. Vulnerability factors together with causes of accidents in the mines and accident management measures have been presented. Accident management measures discussed were EAP, debriefing, individual and group psychotherapy, pharmacotherapy as well as relaxation training.

Chapter Three

Research Methodology

The researcher included this chapter as part of the report in order to outline the steps that he went through in the whole research process. The design that the researcher used will be presented. The researcher will provide the detailed description of the research participants and the procedure that was followed.

3.1. Research Design

According to Babbie and Mouton (2001), research design is a plan or simply a blue print of what the researcher intends to do in the process of conducting the whole research. In the light of the rational of this study, the researcher decided that the most appropriate design of the study would be interpretive paradigm using a qualitative methodology. Interpretive paradigm is a "metatheory which, in opposition to positivism, is based on the assumption that human phenomena are fundamentally distinct from natural phenomena" (Babbie & Mouton, 2001: 74). These writers add that some of the critical differences refer to the inherent symbolic nature of human behaviour and historicity of all human actions (Babbie & Mouton 2001). In the process of gathering data from black South African male mineworkers, this paradigm was relevant because the interest of the study was on the way participants subjectively feel about their awareness that their occupation exposes them to traumatic incidents. This exposure leaves mineworkers with different work-related problems including post-traumatic stress disorder.

The researcher drew all of the participants from the Slater Coal Mines. The researcher focused on male South African mineworkers because they are the majority in the Slater Coal Mines and possibly in all other mining industries. Another reason for focusing on male South African mineworkers was to get their views on managing fatal incidents in the mines referring to their practical work experience. They usually do not get this chance because they are usually at a lower level of the hierarchy, which limits their opportunity to express their ideas that can be useful. Slater Coal Mines has two branches. One branch, known as Magdalene Mines, is halfway between Dundee and Newcastle, which is an open cast focussing on the digging process. The Dundee branch, which is known as the Slater Coal Mines, processes coal extracted and transported from the Magdalene Mines.

The researcher initially phoned one member of the management who attends both of the branches. The researcher presented the aims of the study to this contact person. The researcher asked for permission to conduct the study. This member of the management showed interest in the study and agreed to let his staff members participate and promised to introduce the proposal to the rest of the management. The researcher together with the contact person arranged a date for the meeting between the researcher and the rest of the management. The date and time for the meeting was formulated and the researcher met the rest of the management in the Magdalene branch.

The management of the Slater Coal Mines usually hold regular meetings with employees' representatives on the first Wednesday of each month. The researcher met the rest of the management team in the same meeting and before that meeting started, the researcher introduced himself and presented the purpose of his presence in the meeting. The researcher presented the goals and aims of the study. The management and the employees' representatives showed interest in the study and asked different questions to which the researcher managed to provide answers. When everybody understood and felt interested in the study, the researcher asked for the permission to conduct focus groups in each of the branches. All employees who were in that meeting agreed to participate in the study and the date was arranged for data collection.

The researcher was not familiar with the environment in the mining industry. This necessitated an orientation for the researcher. Few days after the meeting with the whole management, the researcher phoned the administration officer to arrange a date for the proposed orientation. After the agreement was made regarding the date, the researcher came for that orientation.

The orientation took place in the Magdalene branch because that is where the digging process happens. This orientation had a positive impact on the research process and the quality particularly because the researcher was naïve about how the pit of the mines looks like. Exposure to the underground environment was a learning experience for the researcher. The management allocated one of the mineworkers to walk with the researcher during the initial orientation process in the Magdalene branch. The orientation started from the top of the mine pit and proceeded to the underground where the researcher was introduced to the mineworkers who were on duty that day.

To comply with the mining safety policies the researcher had to wear the protective gear that mineworkers wear for safety purposes while they are on duty. This includes helmets with lights on the forehead, overall, breathing device that is hooked on the strong belt tightened on the waist, the ear block devices and knee high rubber gumboots.

Everyone has to put helmets on to avoid possible head injuries that can take place in the plant. The lights, put on the helmets, are important because it is very dark underground. This light serves to let the mineworkers see each other while they are working underground. These lights further make mineworkers see where they are working. Overalls that mineworkers put on have shining yellow stripes that are reflective of light. This reflective colour facilitates the mineworkers' ability to see each other at a long distance because underground tunnels are very long. The management makes sure that all the protective goods are enough in the storeroom to ensure that when the ones that mineworkers use get old, they always have replacements.

The researcher went to one of the offices before the orientation started, to get training on how to use the breathing device. One of the mineworkers is responsible for this training and had to train the researcher on the way the breathing device works in case of emergency.

The ear block devices have to be used and have to be put on before mineworkers go underground. The machines that mineworkers use to dig and crush coal underground are noisy such that there is a possibility for the sound to damage auditory perception of the mineworkers. In addition to the machines, blasting is extremely noisy and everyone underneath has to put the ear block devices to prevent hearing the blasting sound.

Mineworkers have to put rubber gumboots on because mineworkers reach places with water in their digging process underground. Water can easily get inside the short boots and because it is dark underground, it is easy to bump into things while one is walking. As gumboots are made of rubber, they protect the mineworkers against possible injuries.

During the initial orientation, the researcher had a pen and paper to make the field notes. This orientation was very resourceful such that most of the important data that the field notes contained was used as part of the research findings. The use of this information was important because some of it was not obtained using the questions that were formulated to

conduct the two focus groups that the researcher conducted. Orientation was also important because the researcher was able to understand different concepts that participants use to refer to different things and people in their line of work. The researcher also had experience of the work conditions under which mineworkers generally find themselves.

3.2. Sample

The researcher used a purposeful non-random sample to conduct this study. This is a type of non-probability sampling in which the researcher selects units to be observed on the basis of one's own judgment about which ones will be the most useful and representative (Babbie, 1998). The researcher used this method of sampling because of the knowledge that the study was earmarked for people who have experience of working in the mining industry. Terre Blanche and Durrheim (1999) support the use of this sampling procedure in their argument that using the qualitative paradigm; the sample does not need to be selected according to the principle of statistical randomness. The researcher used this sampling procedure because he knew that he needed South African male participants with a history of working in a mining industry. Focusing on the South African male participants served the purpose of concentrating on workers at the lower level of the organisational hierarchy. Other races were excluded because they are not that much involved in the underground digging, which is at times traumatic.

The sample consisted of twelve black male isiZulu speakers all of whom worked for Slater Coal Mines. Six of them worked at Slater Coal Mines, Dundee branch whereas the other six worked in the Magdalene branch. Although the Slater Coal Mines have been operating for less than five years, all of the participants in the study have longer experience because they have previously worked in other different mines. Participants from Magdalene branch are working underground and participants from Dundee branch are processing the coal that Magdalene branch produces and transport to them. The age range of the participants was between 38 and 52 years. The aim of focusing on these participants was the researcher's hope that these participants would provide rich data that the study was trying to elicit from them. Participants in this age range had accumulated sufficient experience of working in the mining industry and they were very resourceful.

3.3. Data Collection

There were preset questions that the researcher had formulated to ask during the data collection process. The researcher conducted two focus groups each of which consisted of six participants. The data were tape recorded in both of the focus groups. The researcher took the field notes during these focus groups to use them during the data transcription process. These field notes were very useful during transcription when something was not clearly audible. These notes were also important in the data analysis process to make labels and developing categories. In both focus groups, questions were asked in a semi-structured fashion and followed themes that emerged from each of them. The use of the semi-structured interviews permitted flexibility and more valid responses from the participants' perception of reality compared to close-ended interviewing (Burns, 2000).

3.4. Focus Groups

Slater Coal Mines have boardrooms in both of its branches. The management gave the researcher the authority to use these boardrooms to conduct focus groups to collect data. All the participants sat on chairs, which they put around the table. There were no interruptions because the boardrooms are both distant from the noisy machine used for coal processing. The researcher asked the participants to give chances to one another when they were responding to the research questions because the data would be transcribed after focus groups were conducted.

Although the researcher used a tape-recorder to collect data, he also took field notes. These field notes were important because although the tape-recorder and the batteries were new, unforeseeable circumstances could have affected the sound quality negatively. In addition, field notes could have been used to supplement and complement the data that the researcher had collected during the focus groups.

3.5. Instruments

The researcher had a tape-recorder to audiotape the data that was collected during the focus group interviews. The tape-recorder that the researcher used operates with batteries. The used tape-recorder is portable such that it was easy for the researcher to carry it around in a small brief case. Although the tape-recorder was well designed for data collection, the researcher turned it towards a respondent when both focus groups were in progress. This was the researcher's attempt to make sure that the tape-recorder captured all the useful data

during the focus group. In both focus groups, the researcher collected data onto new blank tapes.

The researcher had a paper on which the preset questions were written. Although the original questions were written in English, they were translated and presented in isiZulu because all respondents were isiZulu speakers and they had reported to the researcher to have poor educational background. Translating all the questions to the language of the respondents was useful because there was no need to clarify anything for the respondents. Using isiZulu facilitated communication between the researcher and the respondents because this is the researcher's mother tongue.

The researcher further had a pen and exam pads, which were used to write field notes during the data collection process. The researcher intended to use these field notes to develop themes during the grounded theory, which is the data analysis technique that was used.

3.6. Data Analysis

This exploratory study was qualitative and grounded theory, a qualitative data analysis technique was used. Qualitative data analysis is the non-numerical examination and interpretation of observations for the purpose of discovering underlying meaning and patterns of relationships (Babbie, 1998). Grounded theory is inductive and derived from the study of the phenomenon it represents. In the use of this technique, theory is discovered, developed and provisionally verified through systematic data collection and analysis of data pertaining to that phenomenon (Babbie & Mouton, 2001). Using subjective views on labelling some of the data is inevitable since there are no numbers used. The researcher engaged in the data analysis process from the first focus group so that the decision was taken on what to focus on in the second focus group. This early analysis enabled the researcher to compare the emerging themes. The process of data analysis in the study included three coding processes namely: open coding, axial coding and selective coding. The researcher coded data that was already transcribed and printed them from the computer.

Strauss and Corbin (1990) define open coding as the process of breaking down, examining, comparing, conceptualising and categorizing data. In this coding stage, the data from the

transcripts were highlighted and labelled using different concepts. Depending on the length of the highlighted data, the labels were either line-by-line or in paragraphs. The concepts used as labels were written on the margins of each transcript.

After labelling all the data, the concepts used as labels were then grouped together to form categories. A category is defined as the classification discovered when the concepts are compared one against the other and appear to pertain to a similar phenomenon (Strauss & Corbin, 1990). This grouping of the used concepts is higher order and more abstract.

Having the data categorised, the researcher started axial coding. This coding is defined as the procedure whereby data are put together in new ways after open coding by making connections between categories (Strauss & Corbin, 1990). In this process, the data were reorganised according to the conditions, context, action and possible consequences.

After the data were put back together, another coding process called selective coding took place. In this coding process, core categories were selected and related to other categories in order to validate their relationships, to file them for further refinement and development. At the end of the coding process, more accommodative categories were finally identified. Colour pens were used to identify responses from the transcripts that pertained to each of the categories in order that the related responses were easily identifiable

3.7. Ethical Considerations

The researcher obtained permission from the management of both branches of the Slater Coal Mines to conduct the study. In addition, permission was obtained from the representatives of the mineworkers because there was a possibility for the mineworkers to be uncomfortable with participation although the management had agreed. Informed consent was obtained from individuals who participated in both focus groups. Before each focus group was conducted, participants were informed about their right to withdraw at any stage of the data collection process when they wanted to. Participants were also informed prior to the data collection phase that the collected data would be kept confidential, used only for the research purpose and no one else would have access to the information they provided without their consent. Participants were informed that there was no harm that they would put themselves in by participating in the study. Although participants were encouraged to respond to the research questions, they were allowed not to respond to the

questions they perceived to be invading their privacy and leading to responses with the content that they felt uncomfortable to talk about.

Chapter Four

Research Results

This part of the report presents the results that the researcher found after the data was analysed using the grounded theory, a qualitative data analysis technique. Through analysis, the researcher came up with the following four themes:

- Self-definition of the mineworkers: This is represented by different concepts by which mineworkers in the Slater Coal Mines view their experiences at work.
- Manifestation of post-traumatic stress and post-traumatic stress disorder: This is represented by different observable and reported symptoms that mineworkers use to identify colleagues they view as affected by different work-related difficulties in the Slater Coal Mines.
- Perceived causes of the mining accidents: This theme involves situations that mineworkers subjectively regard as contributing to the accidents that occur in their line of work.
- Accident management measures: This includes things that mineworkers regard as limiting the mining accidents and the adverse effects that survivors sustain.

Different quotes from the two transcripts are used below to represent the above themes that the researcher elicited in the process of data analysis. Representative quotes are written in italics. Bold is also used in some quotes to show specific words that represent the above themes.

4.1. Self-definition of the Mineworkers

There are different concepts that mineworkers in the Slater Coal Mines use when they define themselves in relation to their mining occupation. Vulnerability to accidents, exposure to chest-related diseases, exploitation, poverty, oppression and discrimination were the concepts reflected in the self-definition of the mineworkers. Mineworkers are aware of all the mentioned conditions however, life circumstances such as unemployment, poor education background and lack of career development paths compel them to tolerate all traumas to which their occupation exposes them.

4.1.1. Vulnerability to Accidents

Some of the responses from the research participants represent the extent to which mineworkers in the Slater Coal Mines feel vulnerable to different kinds of accidents.

Mining accidents are multidimensional and different quotes will be used as examples. The following quotes represent the nature of different kinds of accidents:

"*Accidents like these represent what we often encounter in the mines. In one of the accidents, the machine crushed two of our colleagues. People who were inside had entered because the machine had been blocked by a big coal rock which was inside so, it was switched off. Someone mistakenly pressed the buttons that are about many metres away and switched the machine on while others were still working inside".*

This accident took place in the Dundee branch of the Slater Coal Mines. It represents the extent to which the machinery that mineworkers use exposes them to injuries and even death. This accident occurred in the Dundee branch although this branch does not operate underground as it focuses only on the processing of coal transported from Magdalene branch.

The following extract indicates the nature of the accidents to which mineworkers are exposed while they are working underground, which is the focus of the Magdalene branch of the Slater Coal Mines:

"When that accident occurred the deceased colleague was connecting wires of the explosives down there. While he was connecting them, the hole collapsed on to him and the coal rocks fell off and buried him. While Mr… was running away, I remained behind and tried to remove all these coal that covered him".

The above extract is suggestive of the risk for the rocks to fall unexpectedly underground. As it appears that mineworkers use explosives to break rocks, the explosion is likely to shake and loosen up neighbouring places, which results in unintended falling of rocks.

Trucks that mineworkers use to transport coal from the Slater Coal Mines to different places also contribute to the mineworkers' exposure to accidents. The following extract represents this situation:

"One of the scary accidents occurred, which involved the truck. The shaft that usually lifts the truck trailer to offload the coal got bent while someone was underneath and he was severely injured".

Besides the accidents to which mineworkers feel exposure, the accidents that occur in the coalmines can be complicated by suffocation because being buried by dusty coal can make breathing difficult. Frequent suffocation may result in different diseases most of which are chest-related.

4.1.2 Exposure to Chest-related Diseases

The following extract represents the situation that participants perceive their occupation as exposing them to chest-related diseases and it is quoted from the data collected from the Dundee branch:

"We normally use the dust mask although this thing can be put on for five minutes and gets hot such that you need to take it off because of the difficulty to breath. Therefore, we just inhale the dust as it is and we even inhale it if we have this mask on".

One may regard the dust mask as worsening the hostile work conditions rather than ameliorating them because it is also uncomfortable to work in a hot environment.

Like the Dundee branch of the Slater Coal Mines, respondents of the Magdalene branch also get exposure to the dusty conditions. The following extract is suggestive of the dusty conditions to which employees are exposed and the way dust makes them vulnerable to different chest-related diseases.

"*Sometimes people working here get sick while they are performing their duties because the nature of the work we do causes dust. When there is a machine blockage, we need to go into the machine to try to unblock it and there is too much dust. Even if you put the dust mask on, when you take it off, you will see that all of the dust will be in your nostrils".*

Based on both of the latter extracts, the dust mask, which is a device designed for protecting employees against dust does not work effectively. These dusty conditions make them feel sickly and witness their colleagues' lives deteriorating because of their work conditions

4.1.3. Exploitation

In most cases, people take risky occupations because of the view that benefits are more than the risks to which their occupations expose them. However, mineworkers feel that they are disillusioned by their work conditions. The following extract represents the extent of the mineworkers' exploitation comparing themselves to people who maintain roads:

"It is mentioned that there was an agreement between the local chief and the owners of the Slater Coal Mines on how much each employee will get as payment but we do not get that money here. We are even paid less than people who work on the road whereas we work underground".

Referring to the above extract it is clear that mineworkers regard themselves as doing an important job compared to the services that road maintenance employees provide. However, they feel disappointment when they compare themselves with road workers in terms of their wages. The mineworkers' exploitation further reflects on comparing time they spend performing their duties and the money they get as their payment. The following extract represents this comparison:

"We are paid for only a 22-day shift and we always have advanced days. We believe that the money for these advanced days has to be involved in the following month but that is not the case. As this man says we are supposed to get money for 25 or 26 days like workers in all other mines".

Referring to this quote, it is notable that when respondents in the Slater Coal Mines compare themselves with mineworkers in other mining industries, they feel that their employer is exploitative than employers in other industries doing the same duties. It is expected that employees be affiliated to labour unions to protect themselves from possible exploitations. This is also the case in the Slater Coal Mines; however, employees in the Slater Coal Mines regard their exploitation as a conspiracy between their employers and the union representatives. The following quote is an example of this perceived conspiracy:

"If we have any queries regarding our dissatisfaction about our wages the management tells us that they negotiate our payment with our union representatives. This union seems to be in favour of the employers and does not work for us as employees. Representatives of

this union have recently been here and they came because of the expected salary increase and the representatives took a large amount of money and disappeared".

With regards to this extract, one may note that the mineworkers regard their interests as not presented appropriately by their unions. They regard their union representatives as promoting their own interests rather than the interests of the mineworkers. Mineworkers in the Slater Coal Mines feel that their union together with the management take an advantage on them because they are poor.

4.1.4. Poverty

Participants in the study feel that poverty exposes them to adverse work conditions as it leaves them with no work-related choices. The following extract represents this frustration:

"When you get employed in this mine, someone who is going to work close to you teaches you how to do your work. Sometimes you accept conditions even if you see that you are not happy with them and aware that they are dangerous. You accept them because you know that the situation at home is difficult and you are desperate for a job".

From this extract, it can be depicted that respondents feel that they usually have difficulties to get employment. High rate of unemployment leaves mineworkers in the Slater Coal Mines with no option but to accept any type of work they come across in order to provide for their families.

The experience of poverty also reflects in the form of bankruptcy that mineworkers experience besides that they are working and expected to have money. The following extract indicates moments when employees feel financial difficulties:

"If you come back in January, you deserve to get R600, 00 but you will be told that this R600, 00 is for your kids. Before you get money for your kids, you have to work for the whole month first. You will never manage to pay school fees in time because money will come at the end of the month. We sometimes have to go to ***Mashonisas*** *to borrow money for children to go to school in January. Everything here is chaotic such that you cannot say that this mining industry is legal".*

In view of the above extract, mineworkers in the Slater Coal Mines encounter financial difficulties just like unemployed people. This condition characterises mineworkers as poor and preventing them from playing their roles as family providers.

Normally, a newly employed worker is usually reluctant to express his or her negative feelings regarding work conditions. However, participants in the study feel that even after serving Slater Coal Mines for some time, they are unable to present their views to the employers. This represents oppression as one of the experienced adversities.

4.1.5. Oppression

The majority of the participants share the view that they are unable to express their feelings with regard to their work-related issues and this makes them feel that they are oppressed. The following extract is representative of this felt oppression:

"Our management treats us in their ancient ways as they are old. If you want to talk about work conditions to anyone in the management they tell you to keep quite".

Participants feel that when they try to express their concerns to their superiors, they are silenced by threats, which explicitly make them feel that if they persist, they can even loose their jobs. Such threats are represented by the following extract:

"If you are not familiar with working in a certain environment, as my colleagues have said, you are compelled to work there. If you do not want to do it, the management threatens you by telling you that you will go out through the gate because you do not want to work anymore".

Referring to this extract, mineworkers have to take risks and work with uncertainty caused by the lack of experience. Based on the same extract, it is possible that time for mentoring that new recruits obtain from experienced employees is not enough to make new employees confident to work independently.

4.1.6. Discrimination

In addition to oppression that respondents experience, some of the data suggest that mineworkers in the Slater Coal Mines sometimes experience discrimination from their

management personnel, which is dominated by white people. The following extract is representative of the experienced discrimination:

"All first aid boxes were given to the Afrikaners and they just sit up there with them. These Afrikaners do not want to give you first aid when you need it. They say that you will contaminate them with AIDS. Although they have gloves they do not want to have contact with us".

In reference to the above extract, it is possible for mineworkers to believe that maltreatment they receive from their employers is influenced by their racial difference. Although the content of the above extract shows that African mineworkers experience racial discrimination, it also implies that their discrimination also exists on the bases of mineworkers' health status. This shows that members of the management (first aiders) have some misconceptions about HIV and AIDS transmission. The following extract is suggestive of discrimination that respondents associate with the abuse that they experience:

"The difficulty that we experience is that this mining industry still has apartheid in it. This is because white elderly people manage us. ***They*** *are already collecting old age pension and they work here to get money out of nothing that they do.* ***They*** *do not even pay tax to the government. These elderly people are sitting on us and let us work like farm workers.* ***They*** *apply their ancient minds on the way they manage us. They do not know that we are also human beings and discriminate us".*

Pronouns that mineworkers use to refer to the management in the Slater Coal Mines suggest that they have negative feelings towards the management. This has a link with the racial difference between the management and the participants. These contempt feelings make mineworkers not identify with their mining occupations. They feel that they are the object and the management is the subject that acts on them. They feel that as workers they are the in-group and treat their management as outsiders belonging to an out-group. Although the findings present this racial perception as the view of the participants, which are at the lower level of their organisation, it is possible for the same perception to be reciprocal.

4.2. Manifestation of Post-traumatic stress and Post-traumatic Stress Disorder

It is possible that all the adversities mineworkers experience cause different life-related problems. From the data, there are responses presenting mineworkers as suffering from a variety of psychiatric difficulties. Depending on the time between a traumatic incident and the manifestation of the consequential difficulties, victims of traumatic accidents in the mines can present with post-traumatic stress and post-traumatic stress disorder. The quoted extracts indicate that employees of the Slater Coal Mines experience both of these difficulties.

4.2.1. Post-traumatic Stress

The following response from one of the participants indicates that post-traumatic stress is one of the symptoms that mineworkers in the Slater Coal Mines experience:

"I can say that when a terrifying accident at work takes place, from the day it takes place, its picture in my mind sometimes stays for about three days before it goes away".

Personal factors such as the victims' level of resilience, determine whether the symptoms remain only as post-traumatic stress or persist until they develop into post-traumatic stress disorder. As the focus of this research was on post-traumatic stress disorder, a core-category of manifestation of symptoms of post-traumatic stress disorder emerged.

4.2.2. Post-traumatic Stress Disorder

There are different ways through which post-traumatic stress disorder manifests itself on the research participants, different quotes will be used as examples of its manifestation.

(i) *Intrusive Thoughts*

The manifestation of post-traumatic stress disorder in the form of intrusive thoughts reflects on the following information extracted from one of the data transcripts:

"The picture of that accident is still in my mind. It is not easy to take it out because although you do not think about it while you are away, when you come back to work and come to the place where the accident occurred, like us who are working there, the picture keeps coming back I do not want to lie to you".

This represents post-traumatic stress disorder because according to the respondent, although it took place few years before this study was conducted, thoughts still haunts him. When these thoughts come back, data shows that the victim avoids places he associates with the incident.

(ii) ***Avoidant Behaviour***

In addition to the intrusive thoughts, that represent the existence of post-traumatic stress disorder, there are responses that are suggestive of the avoidant symptoms of the same disorder:

"If an accident had occurred and I know that one of my colleagues had an accident around here, I try to avoid that place because I know that the accident occurred while he was careful and the same thing can also happen to me too. I must look to see what caused that accident".

The above quote suggests that mineworkers are aware that accidents can be caused by human errors at work. However, avoiding the place of the accident is suggestive of the perceived association between the occurred accident and the place where it occurred.

Further, from the above quote, it is clear that mineworkers identify with each other such that they do not blame others when an accident occurs. They learn from the mistakes that others can commit while they are working. It is also evident that mineworkers in the Slater Coal Mines are able to empathise with their colleagues when they have work-related difficulties.

(iii) ***Terror***

Extreme fear was among the findings that the researcher came up with, after data was analysed. This is one of the symptoms indicative of the presence of post-traumatic stress disorder within respondents' occupational environment:

"Sometimes if you climb up the stepladder with someone, you can see the way that person is shivering and you know that this person is scared and we decide that someone else has to do that".

Although mineworkers present with fear when they work in a place where an accident occurred, they show their fear for the same situation at different levels. That is the reason for them to differ in terms of their ability to perform their duties after an accident. If mineworkers realise that one of their colleagues cannot cope with fear, they share some of the roles and exchange them with other team members. The level of fear that mineworkers present after an accident depends on the severity and possibly the extent of exposure of a victim to that accident:

"The most difficult times are when you have to work right where the accident happened. You try to be careful when you have to work there. It is not an easy task to take someone's dead body between the wheels. Sometimes, we have to take human tissues that are not easily identified to whom they belong because of the severity of that accident".

The idea that mineworkers have to assist with taking dead bodies of their colleagues from the place of the accident can have a secondary effect on people who were not involved in the actual accident. The secondary effect makes the mineworkers who were not directly involved to have almost the same psychiatric problems as the direct victims.

4.3. Perceived Causes of Mining Accidents

Different responses from the transcripts indicate a variety of things that cause accidents in the Slater Coal Mines. Respondents perceive the nature of their work as dangerous, which makes the occurrence of accidents inevitable:

"Almost everything we do in the Slater Coal Mines put us in danger because even the cutting torches that we use are not safe in the same way as we were taught about their safety. Sometimes, you find that these cutting torches are broken and tightened with wire, which is not safe and can break apart at any time".

The above response is suggestive of less priority in the maintenance of the tools that mineworkers use in the processing of coal. Machinery used can be more risky because machines normally need a regular mechanical service. Machines that mineworkers use to process coal are dangerous and contribute to the mining accidents in these mines as it appears in the extract below:

"The first accident occurred in 2004 and that was the one which involved the truck. While we were surprised and frightened, some people were killed by the crusher and it was within less that a month period".

Based on the above extract it is detectable that accidents in the Slater Coal Mines are prevalent. Some of the data imply that safety measures are not fully functional and this has a contribution to the frequency and severity of accidents in these mines. From the extract below, lack of time for safety representatives to practise at work contributes towards the occurrence of mining accidents in the Slater Coal Mines:

"Those who have been trained as safety representatives go on with their normal duties and they forget about what they learnt. What they were taught has all came out of their minds".

Different work conditions in the Slater Coal Mines jeopardise the opportunity for safety representatives to apply their safety skills. The following extract implicates the lack of appropriate training as a problem:

"We do not have people who work as emergency officers. Even those who have been trained as safety representatives are not well trained. They do not get training about the way they should react when an accident occurs. I do not know anything about safety but I might be elected as a safety officer".

In view of the above response, production in the Slater Coal Mines is a priority for the managers rather than safety of the employees. Employees feel that prioritising on production must be proportionate with the priority placed on their safety. The following extract agrees with above-mentioned perception:

"Most of the money is allocated to the tyres for the trucks. Some of the money is allocated to diesel for company trucks and the processing of the coal. If someone has an accident, we know that there is no money that, someone involved in an accident will get. Even the first aid boxes can be full for six years if something has been used from it, it will not be replaced".

It is clear that some safety facilities are there in order to comply with safety requirements although they are not used as expected. These facilities are not used as frequent as occupational conditions require. In addition to prioritising on production, respondents agreed that life difficulties that negatively affect their concentration might contribute to the occurrence of mining accidents. The following extract suggests that death in the family may affect the employee's level of concentration and contribute to the frequency of accidents:

"... One of our colleague's wife passed away and we were able to see that he was physically at work but his mind was not with him. So, such a person can cause an accident".

Based on the above extract, it is notable that personal problems that are not work-related contribute negatively to the mineworkers' concentration. Thoughts about death in the family seem unavoidable and intrusive, which takes the mineworker's attention. Eventually lack of attention perpetuates accidents at work. From the same extract, it is obvious that mineworkers view focus at work as important because accidents may occur because of negligence. Although the above response talks about the employee's negligence, other responses from the data are suggestive of negligence of the management as the cause of some of the accidents:

"It is possible that Mr...had trauma when he looked at our deceased colleague because they brought the deceased up here outside the hole and the ambulances were called to take him from the top here to the hospital. It was the recklessness of the employers that had a significant contribution to that accident".

From this response, mineworkers are aware that spending time with a colleague injured in an accident or dead body of a colleague adds to the trauma one may experience from an accident. The last part of the same extract suggests that there are different things about which employees in the Slater Coal Mines blame their employers although they are scared to express their dissatisfaction openly. The following response from the data indicates that when the Slater Coal Mines were still new, some measures were in place for ensuring that everyone feels occupational safety:

"Long ago it was better because at the beginning of each month, we used to meet to discuss work and the way the work is going. Everyone expressed one's feelings and views about work and working conditions but that does not happen anymore…Management is very active to formulate rules but they do not act according to them. They make rules but they start disrespecting them".

There is a possibility that the discussions that the above response implicates was used as a platform of expressing fears that mineworkers experience soon after an accident. The same monthly meetings should have been used to initiate relocation if someone who has been in an accident feels incapable to work in a certain area because of work-related circumstances. Some of the data suggest that lack of experience contributes to the occurrence of the mining accidents. In view of the following extract, new recruits in the Slater Coal Mines do not have enough orientation to adjust well to their new duties:

"Orientation is only for one day and no one will ever come to you again for a follow-up. This insufficient orientation is one of the situations that cause accidents because such a person will do something with which he is not familiar".

Insufficient orientation time is also suggestive of the blame that respondents feel the management deserves. Besides the mentioned causes of the accidents in the Slater Coal Mines, some of the data suggest that the environment can contribute to the occurrences of the mining accidents. That reflects in the following quote from one of the respondents:

"As far as I understand, that accident occurred because the tunnel was a sharp curve close to where we were working. That bend was open next to a straight area where the machine was busy working. While the machines such as the coal cut are busy working, the whole place becomes lose".

The above extract suggests that some of the accidents are caused by the way the underground site is designed. From the same quote appears that the machines that mineworkers use to dig and process coal contribute to accidents as they shake neighbouring places while they are working. This contributes to the underground unexpected falling of rocks. In order to prevent injuries that mineworkers can sustain from falling of rocks mineworkers put wire fence on the tunnel walls so that the fence hold rocks and prevent

their falling. To prevent rocks from falling down from the roof of the tunnel, mineworkers use the *roof bolts* that they stick onto the roof to keep the rocks tight.

4.4. Accident Management Measures

Mines have different things they use to limit traumatic accidents and their severity. Slater Coal Mines also has these measures although they also have some limitations.

From the above quoted responses, it is clear that besides the insufficient safety training that some of the employees get, they do not get time to practice their safety representative duties. This practice is necessary according to the following extract:

"These traumatic accidents can be avoided by giving practice to those who have already gone for first aid training. They must come and practice here in the plant, as they would manage to advise other workers about things that they need to avoid so that everything can be in order. I hope if they get this chance accidents can be decreased but I do not know".

Lack of experience reflected as one of the contributing factors towards accidents that occur in the Slater Coal Mines. From the following quote, one may argue that the longer the experience the fewer the accidents in the mines:

"To be safe, we protect ourselves so that we do not get injured. We protect ourselves with knowledge we gained from our previous mining experiences. Our employers are fortunate because they employed people like us who have worked in other mines".

From the above extract, it is clear that experience assist in the mineworkers' attempts to take an initiative in protecting themselves against accidents. Long experience can also make employees understand safety rules that they have to follow. The following extract suggests that mineworkers are aware of policies they have to comply with as protective measures at work:

"Mining policy says that everyone must have basic first aid training so that when my team mate has an accident, I can be in a position to help him as soon as possible. If someone is involved in an accident here, that person sits here until he dies because there is no first aid".

Based on the above response, there is a discrepancy between the facilities mineworkers believe they need, compared to facilities available to manage accidents in the Slater Coal Mines. Mineworkers together with their management need to develop some means to make sure that everyone complies with the prescribed occupational policies. Although the blame for lack of safety seems to fall on the employer, there are responsibilities that mineworkers need to take for their safety.

To prevent severity of head injuries, which may result in mental malfunction, Slater Coal Mines does not allow any of the employees to start working without putting on their *helmets* as protective devices. Overalls that mineworkers put on are green in colour, which makes it easy for mineworkers to see each other at a distance. The overalls that mineworkers wear have brightly coloured stripes, which are reflective of light. Reflectivity of these stripes makes it easy for mineworkers to see one another underground because *lights* that mineworkers put on the helmets do not provide enough illumination.

There is a possibility for suffocation when an accident occurs underground; the policy prohibits mineworkers from going underground without carrying their *breathing devices*. These devices have hooks such that they can be hooked on a strong waist belt with which mineworkers put on.

The explosives that mineworkers use underground make a very loud noise that can damage the mineworkers hearing abilities. Further, machines that mineworkers use to dig out coal are very noisy. The safety policy in the Slater Coal Mines compels all the employees to put on *ear block devices* so that mineworkers receive minimal amount of noise in their ears.

Before blasting takes place, the policy compels the miner who starts the blasting, to make sure that he can see that all colleagues are on a safe place and away from places where the rocks fall during blasting. The miner calls everyone to a safe spot by blowing the whistle. According to the safety policy, the miner has to have this whistle always when he works underground. For mineworkers to protect their feet from a variety of injuries the policy compels them to put on rubber knee high gumboots while they are on duty. The following response suggests that government's intervention can play a role in ensuring that everyone respects safety policies:

"I suggested when we had a discussion with my colleagues about our work conditions that the KwaZulu-Natal premier has to be called to come here because he officially opened the Slater Coal Mines when it started to operate".

Possibly, the intervention of the premier's office can have a variety of advantages. One of its necessities would be to protect the employees' right to a safe environment as it reflects in some of the responses that they feel open to different adversities. There are responses in favour of the possibility that the intervention of the premier can improve compliance with South African occupational policies:

"In all the mines in South Africa, the salary increase is supposed to be in July. However, in this mine, our salaries increase in August. If we ask anything, our employer tells us that he is following his own policies not South African policies. That is exactly one of the reasons we need the premier to come here".

Employees in the Slater Coal Mines are unhappy that people such as union representatives have to report to the management whenever they plan to visit mines regarding their work related issues. They feel that the management takes the advantage by telling the union representatives only what will favour the company. Employees feel that this initial communication between the management and their union representatives jeopardises the possibility for union representatives to listen to the workers grievances. This initiates the suspicion that there might be conspiracy between the management and unions against the mineworkers. The mentioned suspicion bases the following response from one of the respondents:

"We would be happy if the KZN premier can come and listen to us. The premier must not start by seeing the management because it would influence him. It would be difficult for premier to listen to our problems after listening to the management".

Through the eyes of an outsider, it would appear as if the management takes all the precautionary measures if there are employees responsible for safety. However, the elected individuals can be viewed as not useful through the eyes of the employees who expect to see the practical usefulness of the individuals elected for safety duties because they have to perform their ordinary duties just like other mineworkers:

"Our management instructs us to elect our safety representatives. However, these people do not get necessary training to make sure that they develop and do what they are elected to do. The management has to take some steps to teach these people about accidents that may occur".

It is advantageous that employees elect people whom they perceive as capable of providing them with safety. However, their presence is not useful unless the management offers them a chance to do what they are elected to do. In view of the above extract, safety education seems to be important for the mineworkers to be able to take an initiative in self-protection. Some of the data suggest that safety training can be more useful if it can be included in the orientation process of the new recruits:

"If someone has newly been employed, there must be an orientation process. One of the experienced workers must teach the newly recruited employees the structure of the whole plant so that they know how to go to different places within the mines. This is important because the new recruit might unwittingly go to dangerous places where an accident can occur. There must be something that can tell the new comer if there is a place where no one is allowed to be close to".

The content of the above extract is suggestive of the devices such as boards that can provide direction and warning signs where accident is likely to occur. In addition, signs that the management manages to put around the mining plant need to be in a language that the majority understands because there are responses indicating that most of the mineworkers have poor academic background:

"There used to be boards that were put on different places although they were in English. They (management) must do that again but these boards must be written in isiZulu as it is our mother tongue because we do not have good academic background. Most people need everything to be interpreted one by one".

Interpretation of the warning messages need patience from the management because although boards can be written in the employees' language, some of the employees cannot read something written in isiZulu because they never had time to go to school at all.

Most of the mining traumatic accidents occur without the mineworkers' awareness. Referring to the above response, there is a need to make sure that mineworkers understand the written safety procedures that can be written in languages that are foreign to their background. Understanding the prescribed rules, mineworkers can gain respect for them.

There are different situations that make these accidents unavoidable, which necessitate responsive measures that can be used after an accident has already taken place to prevent injuries from complicating and initiate healing.

4.4.1. Medical Facilities

Medical intervention is usually the first response to an occurred accident. Some of the data indicate that Slater Coal Mines has such facilities:

"When people get sick at work, there is a doctor around to attend to them. They are taken to the mine doctor who is in Dundee. To have the doctor in Dundee is useful although we pay. However, if there was a doctor working close to us that would be better".

Most of the work that mineworkers do in the Slater Coal Mines exposes them to different diseases. Although the management is aware of these difficulties, employees pay for medical services from their own pockets. A need for a doctor working closer to the workers suggests that mineworkers in the Slater Coal Mines believe in accessibility as one of the important aspects of service provision. From the above response, it is clear that employees are unhappy that they have to pay for doctors when they are sick. The following response further confirms this dissatisfaction:

"If you fall sick while you are at home, you are still an employee but you go to your own doctor and you pay on your own. However, I believe that as you are an employee, the company is supposed to pay".

Some of the data shows that the management of the Slater Coal Mines is aware that the company has to pay for medical expenses if mineworkers suffer from work-related diseases. However, rather than paying for these expenses, management looks for faults on the victim that will exonerate the company from paying the expenses:

"They told us that it is the rule of the company not to be in a place where you were not allocated and needed for your skills but they (management) *do not follow these rules. They end up asking us to work where they initially told us not to go or ask us as to why we were not helping someone in that place. If you have an accident and you are injured, they say that you were not expected to be working there, they tell you that you were not authorised. This is the time they remind you about the duties you were employed for".*

In view of the above extract, Slater Coal Mines management abuses its power over the subordinates. Although subordinates are aware that such treatment is unfair for them, they cannot express their dissatisfaction because of their powerlessness.

From the collected data, it reflects that the management pays only for medical services provided for injuries and illnesses sustained from accidents. It looks like the management would not pay if an employee can fall sick while on leave although the sickness might be resulting from work-related causes:

"If you are involved in an accident and sustain some injuries, you usually go to the hospital in Dundee and the mine doctor attends you while you are in the hospital but the company pays all the expenses".

It is interesting that although all the respondents reported to have poor academic background, they are aware that accidents to which they get exposure leave them not only with physical injuries but also with psychological difficulties:

"I think if accidents occur, people like you (Psychologist) *who come with psychological interventions must be called soon after the accident has happened. We must not discuss it about two years later. We are the ones who are collecting tissues of people who are crushed by machines and nothing is done until the problem goes away automatically".*

From the above response, it can be seen that mineworkers believe that immediate intervention is more effective than the delayed assistance. They further believe that sharing their traumatic experiences can play a role in their therapy process. In addition to the need

for immediacy, the following suggestion, from one of the respondents suggests that medical facilities in the Slater Coal Mines must be easily accessible to the service users:

"We need at least one surgery in this plant and a nurse in addition to people who have had the first aid training. The trained mineworkers will assist the allocated nurse because all other mines are like that that is all. It is only this plant that does not have those facilities".

From most of the above responses, mineworkers in the Slater Coal Mines feel that their management does not appreciate services that they provide to the company. Because of this perception, mineworkers avail themselves to one another during difficult moments to provide support.

4.4.2. Social Support

There are different responses suggestive of the mineworkers' belief in the importance of social support as a coping strategy. It is also interesting that the support for mineworkers in the Slater Coal Mines comes from their colleagues and family members at home:

"If we see that someone has a problem, we negotiate amongst ourselves that our colleague seems to have a problem. We even inform our supervisor and explore with the supervisor if it is possible for our colleague to be given time to go back home for a while to fix up things in his life. People at home need to see how that person is doing".

It is important to note that the support that mineworkers expect from their management is available from other mineworkers and their significant others. Although it is a disadvantage for mineworkers not to have support from their employers, the idea that support comes from mineworkers' colleagues and significant others makes it easily accessible and sustainable. Lack of support from the management reflects in the following response:

"Management does not help us with anything even if we help ourselves; we help someone we are working with. If someone with a problem is not at work, the management regards that person as loafing".

From the above response reflects that mineworkers experience conditional acceptance from their management. If employees cannot perform their duties, they treated as non-important

and the management treats them as human beings only when they are healthy and able to come to work. Because of this lack of understanding from the management, employees may opt to come to work even if they feel sick. It can be difficult for mineworkers to concentrate on pains and their duties at the same time. This can contribute towards accidents as it reflected above that lack of concentration causes accidents in the Slater Coal Mines. The following response suggests that mineworkers value the support that they receive from their colleagues:

"As we are working together, we manage to see that Oh, he is happy today, and that makes it easy to see whenever my colleague has a problem. Sometimes you just ask him what the problem is…we manage to share that problem and sharing helps us. It helps because you feel that relief as you get thoughts from other people".

From this response, one may note that although teams that mineworkers formulate in the Slater Coal Mines are aimed at performing routine duties, team members also use the same teams for their personal gains. Therefore, it is one of the advantages that these teams are multipurpose.

This section has shown the way mineworkers view themselves in relation to their occupation. Their views include their vulnerability to accidents, exposure to chest-related diseases, exploitation, poverty, oppression and discrimination. Some points show post-traumatic stress and post-traumatic stress disorder involves intrusive thoughts, avoidant behaviour and terror. There are occupational aspects regarded as the causing accidents in the mines. Some accident management measures have been outlined including medical facilities and social support that mineworkers get from colleagues and significant others.

Chapter Five

Discussion of Results

The aim of this chapter is to discuss the findings with which the researcher came up through data analysis. The discussion will follow the order of the themes that were elicited in the results section. These themes are self-definition of the mineworkers, manifestation of post-traumatic stress and post-traumatic stress disorder, perceived causes of the mining accidents and accident management measures. These themes will be discussed in details in relation to the above reviewed literature.

5.1. Self-definition of Mineworkers

Research results suggest that mineworkers in the Slater Coal Mines feel that they are vulnerable to different accidents. This feeling has a variety of negative effects in the mineworker's health. This research finding is consistent with Kowalski and Vaught's (2001) view that workers in an environment characterised by different stressors are at risk for injury and mental health problems. In the context of the Slater Coal Mines, workers are likely to experience stress as their work environment exposes them to such injuries. Although mental health problems, likely to develop, are related to continuous occupational stress, head injuries that can occur may result into mineworker's brain damage. Owing to the sensitivity of the brain, its injury can be a significant contributing factor to the mentioned mental health problems.

Mineworkers in the Slater Coal Mines wish to be safe in their work environment however; they are not safe and always feel at risk. There is a discrepancy between the desired state, which is safety in this context, and the existing unsafe working environment. This situation is comparable to the discrepancy mentioned by Carrel, Elbert, Hatfield, Globbler, Max and van der Schyf (1996) as they define stress in the visited literature. The idea that mineworkers in the Slater Coal Mines are aware of their exposure to accidents must be frustrating. The possibility for this frustration is supported by Carrel et al. (1996) in their argument that work conditions may create an environment that leads to conditions such as frustrations and anxiety in addition to stress. Frustration and anxiety are likely to preoccupy the mineworkers' minds in the occupational environment. This preoccupation has negative effects on the concentration of the mineworkers. Poor concentration can make them commit many mistakes that can eventually cause fatal mining incidents.

5.2. Exposure to Chest-related Diseases

Findings of the study suggest that mineworkers in the Slater Coal Mines work under dusty conditions that expose them to sicknesses most of which are chest-related. This finding is in line with the literature as Ngubane and Shuttle (1977) note that people with traditionally African background present with chest problems although they also have other related symptoms as part of post-traumatic stress disorder (Hook & Eagle, 2002). Mineworkers believe that these diseases develop because the protective devices that they use to prevent dust from inhalation are not fully effective. The agreement between literature and the findings may suggest that although chest-related diseases are the symptoms of post-traumatic stress disorder, the same sickness can be caused by poor hygiene.

All of the participants in the study had a traditionally African background and the symptoms with which they present correspond with Piaget's (1962) view that when a traumatic experience defies the victims cognitive categorization, its memory, based on that experience is organised on a somatosensory level (Kaminer, 2006). In this context, the somatic symptoms are presented as chest pains. There is a possibility for the trauma victims to be unable to differentiate between somatic memory and the real pain. This suggest that when mineworker think back to what happened during the accident, they can feel as if they are feeling the real pain again.

Development of diseases is likely to affect the victim's financial functioning negatively because a trauma victim is likely to be frequently absent from work as he or she can be frequently sick. There is a great possibility for somatic pains to disturb the individual's occupational functioning because of a sickly life. Disturbance in these areas of functioning agrees with literature as Kaplan and Sadock (2009) view the distress in different areas of functioning as part of the diagnostic criteria for post-traumatic stress disorder.

Besides the experience of the above mentioned life threatening problems, findings indicate that mineworkers in the Slater Coal Mines feel that they are under employers' exploitation. The perception of exploitation emanates from the employees knowledge of the agreements that were reached in the early stages of opening the Slater Coal Mines. In addition, employees in the Slater Coal Mines regard mining as an important asset of the country and expect their payment to be comparable to other mining industries. This perceived exploitation seems to be multidimensional. Financially, mineworkers in the Slater Coal

Mines feel that there are some days for which they are not paid. This situation develops the feeling in the employees that working in the Slater Coal Mines makes them provide more that they get in return. All these occupational situations suggest that mineworkers feel that services they provide to the company are not proportional to what they gain. Employees also feel that although they pay affiliation fees regularly to their union, their work related issues are not appropriately managed. Mineworkers in the Slater Coal Mines feel that the union representatives are gaining financially at the employees' expense. This feeling is in line with the way Maslach (1986) views stress at the organisational level as including disillusionment regarding the occupation and its conditions (Lee & Mohammed 2006). The imbalance between the expectations of the mineworkers in the Slater Coal Mines and what actually takes place in their line of work is representative of burnout as Carrel, Elbert, Hatfield, Marx and van der Schyf (1996) regards it as the overall perception that an employee is providing more than she or he is receiving as it occurs at all organisational levels and all age groups in an occupational environment.

5.3. Poverty

Although mineworkers are working, there are situations that make them feel that they are poor. This affects them psychologically because as they are known to be working they are expected to be able to provide for their families. Some literature associated trauma with social status levels. To support this association, Summerfield (1995) points out irrespective of whether trauma is human induced or stems from natural disaster, the bulk of people affected by traumatic events tend to be impoverished and oppressed in other ways in their pre-existing life circumstances (Hook & Eagle, 2002). According to the findings, mineworkers in the Slater Coal Mines are presented as poor. This is indicated by the situation that they sometimes have to use illegal loan companies *'mashonisa'* so that they can pay school fees for their children in time. The need to go for services of illegal loan companies develops from the lack of trust between employees and their employers. This is indicated by the observation that although mineworkers deserve to get some money when they reopen after December holidays, they have to wait until the end of the month to get this money together with their monthly wages. As mineworkers are employed, they are not expected to have financial difficulties. Their use of illegal loan companies embarrasses mineworkers in the eyes of the community and to their dependants at home. This situation is consistent with the visited literature as it mentions that candidates may be attracted by mining employment because of the awareness that coal is an important source of energy

and important for the economy of the country. However, the costs of the processing of the product may keep the salaries for the employees low (Campfield & Hills, 2001). For example it is possible for a company to transport raw product to foreign countries for processing and only use the same product after its processing. This can affect salaries of the employees negatively as processing can cost the company such that the company does not gain when the product is bought by its consumers. This can contribute to the level of stress that mineworkers experience as Moedryk (1983), van Zyl (1996) and Smallegan (1989) posit that stress at an organisational level includes issues related to workplace expectations (Lee & Mohammed, 2006).

The work circumstances and the management seem to be contributing factors to the perceived oppression that mineworkers feel. According to the findings mineworkers in the Slater Coal Mines feel that their management does not allow them to express their views. The management presents threats if employees try to express their dissatisfactions. This situation has a negative effect on the relationship between the management and their subordinates. Referring to the literature, this situation can cause stress at an interpersonal level. According to Maslach (1986), stress at an interpersonal level includes relationship problems, difficulties in managing stressful work situations and demands from colleagues (Lee & Mohammed, 2006). It is possible for this aspect of stress to have a negative effect on the team work of the employees. In the context of the Slater Coal Mines, the management is demanding from the employees such that it makes its subordinates feel as if they are not important assets within the company.

There seems to be a mutual influence between the level of poverty, oppression and the discrimination that mineworkers in the Slater Coal Mines experience. Mineworkers seem not to be surprised by the different adversities that they experience and attribute them to the racial differences and the age of the management representatives. They feel that the management grew up during ancient times when African employees were treated as inhuman. This perception of the respondents relate with ideas in the literature as Kaplan and Sadock (2009) contend that traumatization during childhood may have long-lasting negative states and adversely affect the interpersonal relationships and development of an individual. The perceived racial difference is the basis for the mineworkers not to identify with their occupation and feel as outsiders in the industry.

5.4. Post-traumatic Stress and Post-traumatic Stress Disorder

Differences between post-traumatic stress and post-traumatic stress disorder were discussed in the literature section. There are findings from the study suggesting that both of these health problems are observed within the Slater Coal Mines.

5.4.1. Post-traumatic Stress

Some of the findings in the present study suggested that trauma related symptoms last for few days before they fade away from the minds of the victims. This suggests that victims of trauma in the Slater Coal Mines experience post-traumatic stress. Referring to the literature, the development and persistence of traumatic symptoms for only few days are normal if it agrees with a given situation. Concerns develop only when the symptoms persist as their intensity can develop into post-traumatic stress disorder (Campfield & Hills, 2001), which is a significant psychological problem.

Whether post-traumatic stress lasts until it develops into post-traumatic stress disorder depends on the victims' level of resilience. This perception concurs with the way Geyer (1997) describes resilience as stable temperament aspects of an individual moderating stress responses. It determines ways in which victims deal with their traumatic situations in their lives (Stuart & Marais, 2005). Relating to the aspects of resilience is the individuals' subjective perceptions of the event. For an example if a victim is experiencing trauma for the first time in one's life, there are more opportunities for that victim to be shocked, which may cause the individual's responses to be impulsive and worsening to the problem situation. This view can be related to the emphasis placed on the subjectivity of the desired and the perceived states in the definition of stress (Carrel, Elbert, Hatfield, Marx & van der Schyf, 1996).

5.4.2. Post-traumatic Stress Disorder

Besides post-traumatic stress that manifests in ways that have been discussed above, there are findings in this study indicating that some of the respondents in the Slater Coal Mines experience post-traumatic stress disorder. Referring to the results, it is one of the findings that mineworkers in the Slater Coal Mines experience intrusive thoughts. This finding agrees with Seedat, Duncan and Lazarus (2001) as they feel that some of the symptoms, representative of post-traumatic stress disorder include intrusive thoughts, dreams and the re-enactment of a traumatic event. In further agreement with the same finding, Kaplan and

Sadock (2009) emphasise that intrusive thoughts, perceptions and dreams present in a form of distressing images to trauma victims.

Based on the research findings, the distressing nature of the intrusive thoughts makes trauma victims avoid places they subjectively associate with the trauma that they think about. The existence of the avoidant behaviour is in line with the literature as Kaplan and Sadock (2009) posit that an experience that the victim regards as traumatic stays alive as an active memory and continuously intrudes into the victim's awareness. Referring to the same literature, it is the painful nature of these experiences that makes the victims deny or avoid the similar experience.

It is amongst the research findings that workers in the Slater Coal Mines are unable to choose between the duties that they can perform and duties with which they are uncomfortable. Findings suggest that mineworkers sometimes shiver because they are scared to do the work knowing that one of their colleagues had an accident while he was performing the same duties. These findings concur with the literature as Piaget (1962) states in Kaminer (2006) that traditionally African trauma victims present post-traumatic stress disorder in the form of physical symptoms. In view of the agreement between the findings and literature, there is a need for the diagnostic criteria for post-traumatic stress disorder to be revised to accommodate African culture and extend its applicability.

It has been found in the study that although mineworkers in the Slater Coal Mines have to perform duties according to the instructions from the management, when they realise that one of their colleagues cannot perform some of the duties because of a traumatic accident that has recently occurred, they exchange roles amongst themselves. The availability of the colleagues, when one of their team members encounters difficulties, enhances manageability of the difficulties for that member. According to Geyer (1997) manageability is a component of the sense of coherence and refers to the extent to which a trauma victim views necessary resources as available for coping (Marais & Stuart, 2005). Possibly, the availability of other mineworkers for one of their colleagues decreases the pressure on them as individuals. It is because of the same view that Scott and Stradling (1992) argue that psychiatric disorders such as post-traumatic stress disorder may develop to a lesser extent if mineworkers regard their colleagues and management as supportive during difficult times.

Findings show that whether the individual mineworker shows difficulties to go on with routine duties depends on the level of involvement to the accident that has recently occurred. This perception is in line with the view of the American Psychiatric Association (2000) according to which aspects such severity, duration and proximity of the victim's exposure to a traumatic incident play a role in determining whether the victim remains with post-traumatic stress disorder. Based on this view, looking at dead bodies that are cut into different small pieces can increase the opportunities for other mineworkers to develop post-traumatic stress disorder. Further, accidents that take long time to be sorted out, like the ones that keep mineworkers underneath for few days, have more negative effects compared to accidents that get attended for a short period. With regards to proximity, individuals who are directly involved are possibly affected more than the individuals who only hear about the way a traumatic accident took place.

5.5. Causes of Mining Accidents

Findings of the study suggest that most of the duties that mineworkers in the Slater Coal Mines perform are dangerous. The risk of involvement in an accident is added by the lack of maintenance of the machinery that mineworkers operate. Poor maintenance is emphasised by tightening the machines with wire to keep them working instead of servicing them properly. According to Slaughter (2007), this compromised safety may emanate from the idea that South African mining industry competes with modern open cast mineral production in the world market and this situation compels managers to prioritise more on production than safety of the employees.

This finding implies that mineworkers in the Slater Coal Mines are aware that they are at risk and this awareness can have different negative impacts on their health and interest in their duties. Naude and Rothmann (2006) posit that risk of injury at work is one of the problems that result from working in a stressful occupational environment. These authors are also aware that the same risk eventually develops into mental disorders. This increases the likelihood for the development of post-traumatic stress disorder.

Based on the research findings, two accidents in which mineworkers were killed by a truck that the mines use to transport coal and another accident in which people were killed by a crusher occurred in a less than a month period. This suggests that the latter accident took

place while mineworkers were still frightened by the former one as it had recently occurred. Referring to the short period between these two accidents, a conclusion can be drawn that Slater Coal Mines have frequent mining accidents. Referring to Naude and Rothmann's (2006) argument above, there is a great likelihood for the mineworkers to have stress because of the continuous anticipation to experience traumatic incidents at work.

Anticipation of an accident to occur can make mineworkers remain vigilant when they are performing their daily duties. This vigilance suggests that mineworkers may end up suffering from post-traumatic stress disorder as Pillay, Magwaza and Peterson (1992) in literature regard hyper-arousal as one of post-traumatic stress disorder symptoms.

There are different work situations that participants in the Slater Coal Mines blame for the frequency of the accidents in this mining industry. According to the findings of the study, there are people who are elected as safety representatives to limit accidents in the Slater coal Mines. The necessity for these people is supported by the literature as Swanepoel, Erasmus, van Wyk and Schenk (2003) encourage every mining employee to have introductory first aid skills in order to manage accidents in the mines. However, participants in the study are concerned that priority in the Slater Coal Mines is on production and this causes lack of time for elected safety representatives to practise their safety representative duties as they continue with their normal duties.

In addition to the safety representatives that Slater Coal Mines have, literature indicates that emergency infrastructure is an important asset for all mining industries to limit severity of mining accidents (Swanepoel, Erasmus, van Wyk & Schenk, 2003). Participants in the study are aware of the need for emergency officers in the Slater Coal Mines. As participants are aware that their industry does not have these officers they believe that the group that is elected as safety representatives need emergency rescue training. Participants are worried that there are no criteria followed when safety officers are elected and this has a negative impact on the responsiveness of these safety representatives.

Responses of the participants suggest that lack of concentration contributes to the occurrence of accidents in the Slater Coal Mines. This is represented by the idea that respondents in the study regarded thoughts about family problems as impacting negatively

on their level of concentration. This view is in line with Ngubane (1977) and Shuttle's (1994) argument that the African cosmology perceives people as operating in the form of integrated forces with animistic links to the natural and spiritual world (Hook & Eagle, 2002). This cosmology is applicable in the findings of the study because all participants had an African background. It is on the same bases that Carrel, Elbet, Hatfield, Globbler, Marx and van der Schyf (1996) discourages the use of alcohol at work because poor judgement that an employees may experience as a result of thoughts about family issues can be as catastrophic as the poor judgement resulting intoxication.

The mentioned view of human nature is likely to influence attributions of the mineworkers regarding their involvement in the accidents at work. If mineworkers feel that they are responsible for the accidents that may occur in their line of work they are likely to experience guilt. In agreement with this point, American Psychiatric Association (2000) posits that description of painful guilt feelings about surviving when others died characterises individuals suffering from post-traumatic stress disorder. Experiencing guilt can develop into self-mutilation because of anger that mineworkers may impulsively direct to themselves. The possibility to experience anger is supported by literature as Janoff-Bulman and Frieze (1987) argue that regardless of a class and ethnic origin, men tend to present with more anger following trauma exposure (Hook & Eagle, 2002). This argument applies to the participants in this study as they were all males. This possibility further agrees with Maslach (1986) in the argument that feelings of self-isolation and suicidal ideation at the personal level are important symptoms of stress the intensity of which may result in post-traumatic stress disorder (Jordaan, Spangenberg, Watson & Fouché 2007).

Although mineworkers in the Slater Coal Mines usually feel that they are responsible for the accident that occur at work, some of the findings indicate that mineworkers put some of the blame on their management although they are scared to express themselves openly. Usually, it is the responsibility of the management to make sure that emergency facilities are always in place (Swanepoel, Erasmus, van Wyk & Schenk, 2003). One of the accident occurred in the Slater Coal Mines in which one of the mineworkers passed away and participants believed that he would have survived if there was adequate emergency infrastructure in their mines. One of the mineworkers who survived that accident had to assist by carrying the colleague who eventually passed away out of the tunnel while waiting for the ambulance that had been called. This survivor ended up not coping with his

daily duties and had to be referred for therapy. Colleagues, who were the participants in the study, believe that his problem developed because he had a longest exposure to that accident. American Psychiatric Association (2000) supports this suspicion as they regard duration and proximity of an individual's exposure as important in determining whether a traumatic experience develops symptoms of a post-traumatic stress disorder.

If the mineworkers in the Slater Coal Mines regard their management as responsible for accidents in which workers sustain injuries and die, there is a great possibility for the mineworkers to be angry with their management. This situation may result in the political unrest between the management and their subordinates. Swanepoel, Erasmus, van Wyk and Schenk (2003) are aware of the possibility for unrest in the mining industries and regard it as one of the man made disasters within the same industry.

Research findings indicate that when the Slater Coal Mines were still new, the management was still considerate of the ordinary mineworkers. They used to have regular monthly meetings where workers were able to express their views and feelings regarding their work conditions. This suggests that when the same mines were still new, its management was still compliant with the safety acts. One of such acts is Occupational Health and Safety Act No 85 of 1993 (OHSA), which according to the literature protects mineworkers from hazards to health and safety caused by activities of their colleagues in the work environment (Carrel, Elbert, Hatfield, Grobbler , Marx & van der Schyf, 1996). As everyone was able to meet, it was easy for the mineworkers to express their concerns to one another regarding behaviour that may result in a disastrous situation. Jones and Kagee (2005) regard these meetings as always important in the view that discussing trauma related aspects such as feelings and thoughts with others aids their resolutions.

These meetings are still necessary because they seem to have been important for coping. As a group, mineworkers can use problem-focused coping, which according to Moos (1993), comprise interpersonal efforts and reflective of cognitive and behavioural efforts to master or resolve life stressors (Staines, 2000). It is possible that there was time for those meetings because the market for the mines was not yet fully developed. As the Slater Coal Mines was growing, it is likely that the coal demand also increased.

The same meetings seemed to have been useful for mineworkers who had been newly employed in the Slater Coal Mines. Referring to the research findings, lack of experience contributes to the occurrence of accidents that may result in trauma. Lack of experience as a contributing factor to the prevalence of accidents in the mines is supported by van Niekerk (1997) who associates variables such as age and length of service in the mining industry with lower symptoms of post-traumatic stress disorder (Jones & Kagee, 2005). Longer service in the mining industry has advantages for instance if an individual has longer service experience, there is likelihood for such an individual to develop work-related coping skills.

There are differences in the level of exposure between people in the higher positions in the Slater Coal Mines and people at the lower levels. Further, mineworkers with the longer service history are likely to be in the higher positions that do not expose them to traumatic experiences usually happening underground (Jones & Kagee, 2005). Based on the above information, the nature of work that an individual does, plays a role in determining whether that individual can suffer from post-traumatic stress disorder. Caution needs to be taken in differentiating between a resilient individual and the one who does not suffer because there is no exposure to trauma. The idea that experience reduces accidents in the mines is indicative of the necessity for thorough orientation for the new employees in the mines. Research findings show that although Slater Coal Mines provide orientation to the new recruits, participants feel that it is not sufficient because it takes place for only one day.

Literature indicates that there are some environmental factors that contribute to the prevalence and severity of traumatic accidents that occur in the mines. Carrel, Elbert, Hatfield, Grobbler, Marx and van der Schyf, (1996) believe that factors such as inadequate ventilation, airborne contaminations and the design of the underground tunnel have a significant contribution to the accidents in the mines. This idea agrees with the research findings as respondents believed that one of the accidents occurred because the tunnel was a sharp curve close to where one of the big machines was busy digging. Mining machines are big and heavy, which shakes all the nearby places. Slaughter (2007) agrees with the above view in the argument that reaching minerals through blasting and using the heavy mining machinery destabilises the overhead roof and creates constant danger of rock falls. Blasting shakes the whole place and let the rocks fall unexpectedly.

The blasting process includes the use of dangerous gases such as methane which according to Slaughter (2007) has to be used with caution because it is deadly and lighter than air. Its light weight keeps it high overhead and difficult to detect in haulage areas. This risk makes the maintenance of underground fans important because gases can contaminate the whole place particularly when there is poor ventilation. Carrel, Elbert, Hatfield, Globbler, Marx and van der Schyf (1996) encourages maintenance of air circulation devices in the argument that poor air circulation causes discomfort to the mineworkers and the gases used for blasting are lethal and risky to inhale in large amounts. It is usually hot underneath because of poor air circulation. Maintenance of fans can improve air circulation and limit the discomfort that mineworker may experience.

5.6. Accident Management Measures

Findings of the study have different suggestions as part of the strategies for managing traumatic accidents that may eventually result in post-traumatic stress disorder in the mines. Mineworkers in the study felt that first aid practice is necessary for mineworkers who have been elected as safety representatives. This practice will enable them to advise other workers on how to maintain safety at work. This finding relates with the literature as Swanepoel, Erasmus, van Wyk and Schenk (2003) contend that some of the employees must be designated as first aid personnel and should receive special first aid training. For Swanepoel et al. (2003) this training can be more effective if there is a first aid room, first aid equipment and necessary material. These facilities would sustain first aid skills in those who have been trained as findings implicate lack of practice as negatively affecting trainees' abilities to keep these skills.

Besides the necessary practice for the first aid employees in the mines, findings suggest that experience contributes to the ability of the mineworkers to avoid accidents that may occur while they are doing their routine duties. Van Niekerk (1997) in the literature supports the view that there are better chances to manage accidents as a result of service experience in the mines (Kaplan & Sadock, 2009).

Work experience also assists employees to have a thorough understanding of safety policies that they have to comply with in order to maintain safety at work. This awareness relates with Swanepoel, Erasmus, van Wyk and Schenk's (2003) recommendation of the basic introductory first aid training that they believe each mineworker needs. Participants in

the study are aware that their work experience has a positive effect on their knowledge about work-related policies according to which they have to get basic safety training that the literature above refers to.

It is part of the findings that people eventually die because of the injuries that they obtain from accidents in the mines. Participants believe that injuries that mineworkers sustain complicate because the first aid facilities are not there and ambulances take time to come to the mines. They believe that if they have basic first aid skills, they can be able to help each other when accidents occur at work. Although the participants may not be aware, their belief that injuries complicate because of the mentioned reasons and possibly the idea that they can assist each other, promotes the principle of proximity. According to Terblanche (2007), proximity is when support is provided by individuals of normal support systems such as core workers or supervisors who render bio-psychosocial assistance as close as possible to the disaster scene.

The proximal intervention that participants believe in suggests that accidents in the mines have to be treated in the same way as it happens in the context of crisis intervention. According to Kaplan and Sadock (2009), crisis intervention is necessary in the immediate aftermath of a trauma and important for the reduction of opportunistic development of chronic post-traumatic stress disorder and other possible psychiatric and medical complications. If participants believe that intervention has to be soon after an accident, this is in line with the principle of immediacy. Terblanche (2007) perceives immediacy as the provision of trauma intervention as soon as possible after a critical mining incident has occurred in the mining industry.

Working in line with the principles of immediacy and proximity necessitates cooperation between the management and the subordinate mineworkers. This is the case because assisting one another also has a voluntary aspect and a healthy relationship between workers. A healthy relationship between workers can assist them in taking a responsibility of protecting themselves against accidents at work.

Research findings suggest that mineworkers in the Slater Coal Mines make sure that they put on helmets before they start their duties in order to protect their heads. Carrel, Elbert, Hatfield, Globbler, Marx and van der Schyf (1996), regard wearing of helmets in the mines

as important because falling of rocks can result in severe head injuries to the mineworkers. Head injuries need to be avoided because their severity can contribute towards the development of different psychiatric problems. Wearing of helmets is important because they always have lights on their foreheads. These lights are important because it is always dark underground and difficult for mineworkers to see one another and the place where they are working.

Referring to the research findings, mineworkers get exposure to the dusty conditions that develop in the digging and the processing of coal. This exposure is confirmed by literature as Carrel et al. (1996) argue that airborne contaminations that takes place in the mines is one of the contributing factors to traumatic events in the mines.

Findings in the study suggest that participants make use of explosives that make very loud noise. Almost the same noise is made by the machines that mineworkers use to dig and process coal in the mines. Loud noise can have a negative effect on the auditory perception of the mineworkers. According to the Occupational Health and Safety Act, No 85 of 1993 (OHSA) mineworkers have to be protected from hazards to health and safety that activities of their colleagues can cause. In compliance with this act, mineworkers have to always use sound blocking devices to limit possible auditory damages (Carrel, Elbert, Hatfield, Globbler, Marx & van der Schyf, 1996).

There are research findings indicating that communication is important in the mines as this can also assist in the elimination of accidents in the mines. For example, miners in the Slater Coal Mines use whistles to make all mineworkers aware that the blasting is about to take place. In agreement with this finding, Swanepoel, Erasmus, van Wyk and Schenk (2003) regard effective communication system as important part of the effective emergency infrastructure in an occupational environment. The team leader at the Slater Coal Mines blows the whistle to make sure that everyone is far from where the blasting will take place and from where rocks of coal can fall.

Some of the findings indicate that management of the Slater Coal Mines compromises safety of the mineworkers. In addition mineworkers in the study believe that they do not get their wages increment on time. These dissatisfactions have influenced participants to believe that inviting the KwaZulu-Natal premier can help them ameliorate their

occupational problems. It would be useful for the employees to follow an appropriate protocol such as communicating their concerns to the minister of labour who in turn communicates with the premier. Presenting grievances of the workers in the Slater Coal Mines would be in line with the intensions of the Mine Health and Safety Act as it promotes cooperation between the state, employers, employees and their representatives (Swanepoel, Erasmus, van Wyk & Schenk, 2003). Communication with the state can facilitate the evaluation of the policies of the Slater Coal Mines. This evaluation is important because participants report that when they question the way the mines operate, their employers tell them that they follow their own policies rather than the government's policies.

The inclusion of the state can also assist in looking at the current representatives of the mineworkers because they feel that their union representatives end up in agreements with the management which do not cater for the mineworkers needs. It is for the same reason that mineworkers in the Slater Coal Mines want to communicate their concerns directly to the premier such that they do not want the management to be aware when the premier comes to the mines. Participants are scared that the premier may end up serving the interests of the management than their interests as mineworkers. They are also scared that this communication can jeopardise their relationship with their employers.

The invitation of the government may be important for making sure that individuals elected as safety representatives do their safety representative duties as it is one of the findings that these representatives go on with their ordinary duties. Participants believe that training that these safety representatives get is not enough. Their training is important such that the literature recommends consideration of outside training experts if a certain mining industry does not have employed trainers (Swanepoel et al., 2003).

It has reflected above that literature and the findings of the study implicate lack of experience as a contributing factor to the traumatic accidents in the mines. This agreement suggests that training of the elected employees can be useful in the orientation process for the newly employed mineworkers. According to the literature individuals in charge of the orientation of the new recruits must have a plan of the whole mining plant. This plan includes entrances to different buildings, main electricity boards, hazardous substances, inflammable materials and gas cylinders as well as fire extinguishers (Swanepoel, Erasmus,

van Wyk & Schenk, 2003). To accommodate the observation that the majority of the mineworkers in the Slater Coal Mines report having poor academic background, it is recommended that the directions and the warning messages be written in a language that the majority of the employees can understand.

5.7. Medical Facilities

Findings in the study suggest that the nature of work within the mining industry exposes mineworkers to different diseases that sometimes results from physical injuries sustained from traumatic accidents. The literature confirms the existence of medical problems as Duffy and Wong (1996) contends that although stress presentation has a variation, medical problems such as ulcers and high blood pressure are the symptoms of stress. Participants reported that they have a doctor who treats them whenever they fall sick. Whether appropriate referrals are made, depends on the facilities available and the companies' awareness of the services that different health professionals can provide. Terblanche (2007) believes in the training of mining supervisors to be able to recognise mineworkers suffering from post-traumatic stress disorder so that they can consider referrals to medical practitioners depending on a need.

Appropriate medical assessment results determine what medication can be effective in treating post-traumatic stress disorder. Besides the importance of medical assessments, Kaplan and Sadock (2009) believe that amitriptyline or imipramine frequently remains the established form of effective treatment. These are the tablets taken orally used as antidepressants. Psychiatrists prescribe these drugs and regard them as more effective towards the core intrusive features of port-traumatic stress disorder. Although mineworkers in the Slater Coal Mines are happy to have doctors who are available, they seem to prefer their doctor to be always on their mining site and not to be called from away.

Findings suggest that mineworkers in the Slater Coal Mines are aware of the negative effects that their occupation has on their immune system. This makes them believe that the company has to pay for their medical expenses even if they fall sick while they are not at work. However, the company pays for the expenses only when they get injuries and fall sick while employees are at work. Referring to the possibility of having different difficulties that result from psychological, medical and emotional problems that mineworkers end up suffering from (Duffy & Wong, 1996), it would be recommended that

the company pays for medical problems that appropriate assessments view as resulting from the nature of the patients' mining duties. Payment should be made regardless of where the patient is when the associated sickness starts.

Research findings suggest that the management is aware that the company has to pay for medical expenses that mineworkers get in when they fall sick because of their occupations. Findings suggest that management usually look for reasons that protect the company from paying such as the employees' negligence. For example, acts such as Occupational Health and Safety Act No 85 of 1993 lays down rules for preventing accidents at work (Carrel, Elbert, Hatfield, Globbler, Marx & van der Schyf, 1996). When one of the mineworkers in the Slater Coal Mines is involved in an accident the management reminds them of the rules of the company and acts that will regard the employees as negligent and therefore not get compensated for their injury on duty.

The research findings point out that mineworkers suffer not only from medical problems. They believe that they sometimes have mental problems that they feel can be managed by consulting with psychologists. They further feel that management delays intervention until their problems go away automatically. This finding seems to suggest that trauma accidents and related problems must be treated as crises and their management must follow the same procedure. Kaplan and Sadock (2009) view crisis intervention as necessary immediately after a traumatic accident. They believe that this timing reduces the opportunistic complications. Stein and Eisen (1996) regard crisis intervention as useful for assisting the employees to return to work sooner and reducing absenteeism (Campfield & Hills, 2001). This nature of crisis intervention seems to be more effective in the reduction of an avoidant behaviour that usually occurs immediately after an accident. A quick recovery for trauma survivors seems to be equally beneficial for employees and the management of the Slater Coal Mines.

5.8. Social Support

Research findings suggest that mineworkers in the Slater Coal Mines communicate with each other while they are working. They regard such communication as important for their ability to note whenever one of their colleagues has a problem. They use such information to report to their superiors and ask if it is possible for that colleague to take time off. Participants believe that if their colleague has a problem, one must go back home to be

attended by the family. This belief is in line with the usefulness of family members as they comprise a support system in promoting the principle of proximity (Terblanche, 2007). The usefulness of the family reflects in Scott and Stradling's (1992) view that within the family context, interpersonal feedback constitutes an important environmental influence on the victim's thoughts, feelings and behaviour.

Whether a trauma victims benefits from assistance that a family may provide depends on the way his family copes with different life difficulties. Bloomfield (1998) believes that although significant others can be helpful; there is a possibility for them to interfere unwittingly with the recovery of a trauma survivor. Findings suggest that the family seems to be more important for mineworkers in the Slater Coal Mines because there is no support that participants get from their management. The availability of the family members for trauma survivors can enhance the perception of manageability. This refers to the victims' appraisal of resources necessary for coping as available during life difficulties (Marais & Stuart, 2005). This means that mineworkers in the Slater Coal Mines have their colleagues together with the family members as social resources. To avoid destructive attitudes, it can be useful to provide psycho-education to colleagues and significant others who avail themselves to trauma victims.

The research findings indicate that communication with colleagues within the Slater Coal Mines facilitates the workers ability to enquire further whenever they realise that one of their colleagues has a problem. When trauma survivors share their difficulties, findings suggest that they feel some relief because they get thoughts from other people. This seems to be promoting the principle of comprehensibility. According to Antonovsky (1983) comprehensibility is the extent to which trauma survivors make sense of the trauma that one has experienced. The more clear a sense that a survivor makes, the more resilient the victim against that traumatic experience (Marais & Stuart, 2005).

Chapter Six

Conclusions and Recommendations

6.1 Introduction

It is necessary for this chapter to revisit the aims of the study in order to provide conclusions the researcher drawn from the results. There will be the presentation of the limitations of the study and finally the recommendations that can hopefully cater for the limitations of the current study.

It reflected in the first chapter of this thesis that the researcher intended to identify and describe the existence as well as the prevalence of PTSD as one of the mental health problems in the South African mining industry. It investigated the manifestations of PTSD within the mining industry. This study described and identified the risk factors that usually make individuals vulnerable to PTSD. It explored strategies that mineworkers use in the diagnosis and management of PTSD in the mining industry.

6.2. Conclusions

Based on the results and their discussion in the last chapter, the following conclusions are drawn.

6.2.1. Prevalence of Pos-traumatic Stress Disorder within the Mining Industry

Referring to the findings of the current study, PTSD is still prevalent within the South African mining industry. This shows that there are no practical improvements in the ways in which mineworkers are treated in the same industry. Showing this lack of improvement, Lee and Mohammed (2006) regard the period before 1979 as marked by racism and exclusion of black workers from the whole industrial system. They further argue that from the time of Conciliation Act of 1924 black people were effectively excluded from the definition of an employee and thereby excluded from the industrial mechanisms. There is a possibility that the South African mining industries owned by white employers are still reluctant to accommodate black employees.

It reflected amongst the current research findings that the management of the Slater Coal Mines treats their employees in the same way as they were treated during the apartheid era. This treatment corresponds with the way management representatives, who are presently in their old age, were treated during their productive times. Based on the findings of this

study, it can be concluded that the management of the Slater Coal Mines still follows outdated policies. Such treatment develops hostility in the working environment, which results in stress, which in turn develops into PTSD as it is chronic and sometimes complicated by traumatic incidents at work. The current accommodation of black people seems to be an attempt to comply with the new government policies that recommend employment of African people. One of these policies is affirmative action, which according to Carrel et al. (1996) has a backlog in South Africa. These authors regard equal employment opportunity and affirmative action as government initiated, legally driven efforts to change the makeup of the company's workforce. Although white employers apply these policies, it looks like they apply them for the sake of compliance with government policies and not that they believe in them.

The idea that management in industries such as Slater Coal Mines follow policies of the apartheid era contributes to the inability of the mineworkers to participate in negotiations regarding their wages. According to Lee and Mohammed (2006) Black trade unions during the apartheid era were not banned but they could not register and participate in industrial relations machinery at a firm or industrial level. They view this situation as meaning that black workers could not negotiate wages and conditions of employment, have their grievances alleviated individually with management or through a trade union.

The conditions implicated in the above paragraph are still existent in the Slater Coal Mines and besides the trauma related to incidents at work it is clear that mineworkers in the Slater Coal Mines experience trauma of losing their respect as they have limited ability to meet responsibilities of breadwinners in their families. This adds to the trauma of losing their manhood as they cannot provide efficiently because of the low wages. According to Mangan (1996) among the roles that real men have to play is responsibility for other people, which is presented as a breadwinner in the family and expandability (Dumakude, 2004). The limited ability for mineworkers to meet expectations of their family members is very stressful and adds to the stress that work conditions cause. Based on the literature and the findings of the current study, these conditions are likely to result in PTSD and other opportunistic psychiatric conditions.

Literature indicates that chronic stress, which usually complicates into PTSD, affects mineworkers' level of immunity negatively (Duffy & Wong, 1996). This suggests that

mineworkers are likely to develop other diseases when their stress ruins their immune system. This suggests that any opportunistic illnesses should be accommodated when mineworkers fall sick because chronic stress that they experience at work has a significant contribution.

The idea that chronic stress ruins the individual's immune system suggests that it has similar effects as human immune deficiency virus (HIV) which complicates into AIDS. Carrel et al. (1996) argue that the prevalence of AIDS in the mining industry is very high. They further observe that the prevalence of AIDS in this industry has led to the innovative cooperation between the National Union of Mineworkers and the Chamber of Mines. This cooperation developed an agreement of formulating some principles relating to HIV. Based on these principles, HIV infections are to be no different to those applied to any other serious medical conditions. The same agreement protects HIV positive employees from discrimination, victimisation and harassment. Based on this agreement, no employee is to be tested for HIV unless the testing is on medical grounds and required for epidemiological purposes.

The above agreement led to the development of AIDS policy within companies including the design and implementation of education and awareness campaigns as well as providing counselling. These facilities have relevance to the Slater Coal Mines as it reflected amongst the findings that black mineworkers are discriminated by their white management (Carrel et al., 1996) when they need medical treatment for their occupational injuries.

Aids education and campaigns are important for mineworkers in the Slater Coal Mines. As mineworkers are prepared to provide support to one another, this education can assist them to respond in a supportive way and avoid accusatory responses that can develop a guilt feeling. The guilt feeling can add to the mineworkers' trauma of finding out about their positive HIV status.

6.2.2. Systems of Managing Post-traumatic Stress Disorder

Although there are different measures that can be used to manage mental health disorders following a disastrous incident in the mines, participants in the Slater Coal Mines seem to benefit from support they get from other mineworkers. Cultural background of the participants seems to contribute to the types of measures that they use to cope with trauma

at work. Christopher (1996) informed by the anthropological background, defines culture as "webs of significance that give coherence and meaning to our lives" (p. 17). Christopher views culture as permeating our lives more thoroughly or pervasively than we tend to consider. This suggests that culture plays a role in determining which measures to use to cope with PTSD and possibly other different life challenges.

Participants in the study seem to value their colleagues as providing the mentioned life aspects to their lives. All of the participants were coming from a traditional African background. This background corresponds with the collectivist cultures. According to Mpofu (1994) collectivist cultures foster a sense of the self which emphasises members' spiritedness rather than individual privacy, the common as opposed to the unique and the members' compatibility with people, objects and circumstances.

Collectivist cultural background seems to be playing a role for the mineworkers to share difficult times at work. Mineworkers in the Slater Coal Mines regard their self identity in terms of their subjective connectedness with their significant others. This felt connectedness enhances sharing of work-related problems with other core-workers and family members in their homes.

Mineworkers' feelings that they do not get any support from the management during traumatic incidents is possibly emanating from the idea that management is dominated by white people whose background is Eurocentric. According to Mpofu (1994), there is an association between Western cultures that have tended to misconstrue personal freedom, responsibility and achievement as synonymous to individualism. This suggests that mineworker in the Slater Coal Mines cannot identify with their management because management has an individualistic identity. This management's identity makes its representatives expect mineworkers to cope independently with PTSD to which the nature of their work exposes them. Because of the belief in independence, management is likely to discourage sharing of the traumatic experiences that mineworkers encounter in their line of work.

The idea that mineworkers in the Slater Coal Mines are able to see if one of their colleagues is not coping with traumatic accidents suggests that they can benefit from self-help groups. Although self-help groups are sometimes led by a professional, they are more

often comprised of lay people whose experiences and common situations act as motivators and guides for others in the group (Duffy & Wong, 1996). The idea that mineworkers share exposure to traumatic incidents can be regarded as a motivator for the development of their self-help groups. The nature of this group may be beneficial if it includes a professional in its early stages of development. Presence of a professional may be useful to train group members to run the same groups on their own so that they can take turns in chairing each group session. Such training can sustain the observable benefits of these groups.

The view that mineworkers are able to see when one of their colleagues is not coping with trauma related incidents at work and the finding that they do not get support from their management suggest that some of the mineworkers in the Slater Coal Mines can benefit from peer group supervision. According to Hamburg (2008) peer group supervision is an effective form of leaderless peer group counselling. Benshoff (2008) regards the same kind of supervision as the arrangement in which peers work together for mutual benefit. The benefit of the peer group supervision is enhanced by the idea that group members are at the same level in their organisational hierarchy. The similarity of their level enhances their level of expressiveness.

Although peer group supervision can be directed at improving coping skills for the mineworkers, it can also be beneficial for the employers. According to Benshoff (2008), the basic premise underlying peer consultation is that participants who have been trained in basic helping skills can use the same skills to help each other function more effectively in their occupational roles. In the context of mining industry, mineworkers can make their affected colleagues aware that their performance is deteriorating, which can indirectly elicit an explanation that can possibly relate to recently experienced trauma at work.

Peer group supervision can enhance sources of social support. Availability of social support can work against the development of PTSD as the literature above implicates the lack of social support as a contributing factor to the development of the same disorder. These skills can be more useful to the mineworkers who are elected as safety officers because besides safety duties they also go on with their daily mining duties. Although the literature warns that one has to differentiate between people who do not experience post-traumatic stress disorder because they can cope with it and those who do not experience it because they are not exposed to it, in the current study, the findings indicated that mineworkers with

longer experience of working in other mining industries cope more than their colleagues with less experience. Longer experience of some of the workers enhances their ability to provide social support to the workers they perceive as unable to cope with traumatic incidents at work.

6.3. Limitations of the Study

Aspects that will be discussed below are the flaws of the present study that the researcher was aware of. These limitations place boundaries to the extent of generalizing the research results and applying them to a larger population.

This study was cross-sectional, the data was collected only once and participants were not followed through. Following the same participant from one occupation to the next and from when they are newly employed until they have experience can enrich the collected data.

The study achieved its goal of focusing on the mineworkers. However, its limitation is that it only focused on mineworkers at the lower levels and did not include the views of the management. The management can have views different from those of the employees at a lower level.

The focus was on South African male mineworkers, who were all isiZulu speakers. Focusing on this sample will hopefully develop a racially accommodative classification of post-traumatic stress disorder and other disorders related to it. The focus on one race and gender limits the generalization of results to other different races such as white people. The same results cannot be generalised to the minority of women who work in the mining industries.

Two focus groups were conducted to collect data. The use of other data collection techniques such as individual interviews would have enriched the collected data. Using a variety of data collection techniques would have brought a need to use quantitative analysis, in addition to the qualitative data analysis technique that was used.

The level in the organisational hierarchy determines the level of exposure to traumatic incidents in the mines. This suggests that a larger study focusing on employees at different levels of the organisational hierarchy can be a good recommendation. This would show if

there is any difference in the level of PTSD between mineworkers based on their levels of occupational positions.

Different mines use different ways to produce and process their minerals because of the different levels of technological development. It is possible for industries using advanced technology to have less traumatic accidents compared to industries that are still developing. Technological development is in line with the economy of the province and the country where the mines are based. As the present study was conducted only around Newcastle, which is located in the Northern KwaZulu-Natal, its findings can neither be generalised to other provinces nor other countries that can be at a different level of economic and industrial development.

6.4. Recommendations

A longitudinal study that follows participants over a long period of time is still necessary. Such a study would enable researchers to differentiate between people who experience less post-traumatic stress disorder because of the relevant experience and people who do not develop the same disorder because they have natural resilience. A longitudinal study can further show the frequency for the occurrence of the mining accidents within one mining industry compared to others

The provincial location of the mines has a role in determining its economic and technological development. Owing to the awareness of the differences in the technological development of different mining industries, a study that compares different mining industries is a strong recommendation. This comparative study would identify the role that technological development plays in the reduction of traumatic incidents in the mines.

A comparative study that can focus on gender differences is recommended. Such a study can be informative because the reviewed literature implicated gender differences as having a role to the level at which post traumatic stress symptoms are presented and the level at which they are experienced.

A further comparative study focusing on different races that work in the mining environment can also be recommended. This study can enhance the generalisability of the

findings and contribute to the review of the diagnostic criteria of post-traumatic stress disorder and other closely related mental problems.

Only two focus groups were conducted, and there is a possibility that other data collection techniques such as participant observations can enrich the collected data. Further, to achieve goals of the present study, the researcher used a qualitative data analysis technique. Quantitative data analysis would also enhance objectivity of the research findings.

References

American Psychiatric Association. (2000). *Diagnostic and statistical manual of mental disorders-IV-TR.* Fourth Edition, Text Revision. Washington, DC: American Psychiatric Association.

Antonovsky, A. (1983). The Sense of coherence: Development of a research instrument. *Schwartz Research Center for behavioural Medicine, 1,* 726-733.

Babbie, E. (1998). *The practice of social research,* 8th edition. London: Wadsworth Publishers.

Babbie, E. & Mouton, J. (2001). *The practice of social research, South African Edition*: Cape Town: Oxford University Press South Africa.

Badenhorst, J. C. C. & Van Schalkwyk, S. J. (1992). Minimizing post-traumatic stress disorder in critical minimizing mining incident. In Maiden, R. P. (ed.). *Employee assistance programs in South Africa*. New York: Haworth Press.

Baldwin, B. A. (1979). Crisis intervention: An overview of theory and practice. *The Counselling Psychologist*, *8*(2), 43-52.

Barber J. P, Stratt, R., Halperin, G., Connolly, M. B., (2001). Supportive techniques: Are they found in different therapies? *The Journal of Psychotherapy Practice and Research, 10* (3), 165-172.

Beck, A. T. & HAAGA, D. A. F. (1992). The future of cognitive therapy. *Psychotherapy, 29*(1), 34-38.

Benshof, J. M. (2008). *Peer consultation as a form of supervision*. [On-Line]. Available: http://www.ericdigest.org/1995-1peer.htm. [2008, October 24]

Berg, B. L. (2004). *Qualitative research methods for the social sciences,* (5th ed.). Boston: Pearson Education, Inc.

Blanchard, E. B. & Ahles, T. A. (1990). Biofeedback therapy. In J.J. Bonica (ed.), *The management of pain* (2nd ed.) (pp.1722-1732). Malvern, PA: Lea & Ferbiger.

Bloomfield, H. (1998). *Healing anxiety with herbs: Proven cures for anxiety and insomnia.* London: Thorsons.

Brannon, L. & Feist, J. (1992). *Health psychology: An introduction to behaviour*

and health, (2nd ed.). California: Wadsworth Publishing Company.

Burns, R. B. (2000). *Introduction to research methods.* London: Sage Publishers.

Campfield, K. M. & Hills, A. M. (2001). Effects of timing of critical incident stress debriefing (CISD) on post-traumatic symptoms. *Journal of Traumatic Stress 14,* 327-340.

Carrell, M. R., Globler, P. A., Elbert, N. F., Marx, M., Hatfield, R. D. & van der Schyf, S. (1996). *Human resource management in South Africa.* Pretoria: Prentice Hall South Africa (PTY) Ltd.

Christopher, J. C. (1996). Counselling's inescapable moral visions. *Journal of Counselling and Development, 75,* 17-23.

Duffy, K. G. & Wong, F. Y. (1996). *Community psychology.* Boston: Allyn and Bacon.

Dumakude, C. C. (2004). *Perception of masculinity by Black South African sportsmen.* Unpublished masters thesis, University of KwaZulu-Natal, Pietermaritzburg.

Everly, G. S. (1995). The role of critical incident stress debriefing process in disaster

counselling. *Journal of Mental Health Counselling, 17,* 278-290.

Everly, G. S. & Mitchell, J. T. (1999). *Critical incident stress management: CISM: A new era and standard of care in crisis intervention* (2nd ed.). Ellicott City, MD Chevron Publishing Cooperation.

Folkman, S., Lazarus, R. S., Gruen, R. J. & Delongis, A. (1986). Appraisal, coping, health Status and psycholegal symptoms. *Journal of Personality and Social Psychology, 50,* 571-579.

Geyer, S. (1997). Some conceptual considerations on the sense of coherence. *Social Science Medicine, 44*(12), 1771-1779.

Hamburg, K. T. (2008). *Peer group supervision.* [On-Line]. Available: http://www.peer-supervision.com/. [2008, October 24]

Helzer, J. E., Robins, L. N. & McEvoy, L. (1987). "Post-traumatic stress disorder in the general population: Findings of the epidemiological catchment area survey", *New England Journal of Medicine, 317,* 1630-16-34.

Hermanus, M. (1991). Occupational health and safety:A NUM perspective. *IPM Journal, 9*(9), 17.

Hook, D. & Eagle, E. (2002*). Psychopathology and prejudice.* Cape Town: University of Cape Town Press.

Hooley, J. M., Orley, J. & Teasdale, J. D. (1986). Levels of expressed emotions and Relapse in depressed patients. *British Journal of Psychiatry, 148*, 142-647.

Jacobson, E. (1938). *Progressive relaxation: A physiological and clinical investigation of muscle states and their significance in psychology and medical practice* (2nd ed.).Chicago: University of Chicago Press.

Janoff-Bulman, R. & Frieze I. H. (1987). The role of gender in reactions to criminal victimization. In Barnet R. C. Baruch G. K. (eds), *Gender and Stress,* pp. 159-84. New York: Free Press.

Jones, R. & Kagee, A. (2005). Predictors of post-traumatic stress symptoms among South African police service personnel. *South African Journal of Psychology, 35* (2), 209-224.

Jordaan, I., Spangenberg, J. J. Watson, M. B. & Fouché, P (2007) Emotional stress and coping strategies in South African clinical and counselling psychologists. *South African Journal of Psychology, 37* (4), 835-855.

Kaliski, S. (2006). *Psycholegal assessment in South Africa.* New York: Oxford University Press.

Kaminer, D. (2006). Healing process in trauma narrative: A review. *South African Journal of Psychology*, *36*(3), 481-499.

Kaplan, H. I. & Sadock, B. J. (2009). *Comprehensive textbook of psychiatry* 9th ed. Philadelphia: Wolters Kluver Health/Lippincott Williams & Wilkins.

Lazarus, A. A. (1966). *Psychological stress and the coping process*. NewYork: McGRAW-Hill.

Lee, G. J. & Mohammed, Y. (2006). Perceptions of workplace issues among blue-collar workers in South Africa's Gauteng Province. *South African Journal of Psychology, 36*(1), 45-62.

Mangan, J, A. (1996). *Tribal identities: Nationalism, Europe, sport*. London: Frank Class & Co Ltd.

Marais, A. & Stuart, A. D. (2005). The role of temperament in the development of PTSD amongst journalists. *South African Journal of Psychology*, *35*(1), 89-105.

Maslach, C. (1986). Stress, burnout and alcoholism. In R. R. Kilburg, P. E. Nathan, & R. W. Thoreson (Eds.), *Professional in distress: Issues, Syndromes, and solutions in psychology* (pp. 53-75). Washington, DC: American Psychiatric Association.

McKenna, E. F. (2000). *Business psychology and organisational behaviour*: A *student's handbook,* (3rd ed.). London: Psychology Press Ltd.

Mitchell, J. T., & Everly, G. S. (1995). *Critical Incident stress debriefing: CISD: An operations manual for the prevention of traumatic stress among emergency service and disaster workers* (2nd ed., Rev.). Ellicott City, MD: Chevron Publishing Cooperation.

Mpofu, E. (1994). Exploring the concept of self in the South African culture. *Journal of Genetic Psychology, 155*(3), 341-354.

Moedryk, A. P. (1983). *Black advancement and stress: A literature review and conceptual synthesis.* Johannesburg: National Institute for personnel research.

Moos, R. (1993). *Coping responses inventory-adult form: Professional manual.* Odessa: Psychological Assessment Resourses, Inc

National Center for PTSD (2009). *Treatment of PTSD.* [On-Line]. Available: http://www.ptsduk.co.uk/treatment .html. [2009, March 30]

Naude, L. & Rothmann, S. (2006). Work-related well-being of emergency workers in Gauteng. *South African Journal of Psychology, 36*(1), 63-81.

Ngubane, H. (1977). *Body and mind in Zulu medicine*. London: Academic Press.

Parkinson, F. (1997). *Critical Incident Debriefing: Understanding and dealing with trauma.* London: Souvenir Press.

Paton, D. (1995). *Dealing with traumatic incidents in the workplace: Management and organizational strategies for preparation and support*. Perth: Curtin University.

Piaget, J. (1962). *Play, dreams and imitation in childhood*. New York: Norton.

Pillay, Y. Magwaza, A. & Petersen, I. (1992). Civil conflict in the Mpumalanga: Some mental health sequelae in a sample of children and primary care givers. *South African Journal of Child and adolescent Psychiatry, 4*, 42-45.

Reber, A. (1985). *Dictionary of psychology*. England: Penguin Books.

Rothbaum, B., Meadows, E. A., Resick, P., & Foy, D. W. (2000). Cognitive-behavioural therapy. In E. B. Foa, T. M. Keane, & M. J. Freidman (Eds.), *Effective treatment for PTSD* (pp. 60-83). New York: Guildford.

Scott, M. J. & Stradling, S. G. (1992). *Counselling for post-traumatic stress disorder*. London: Sage Publishers India Pty Ltd.

Sdorow, L. M. (1993). *Psychology, 2nd Edition.* England: Brown & Benchmark Publishers.

Seedat M., Duncan, N. & Lazarus, S. (2001). *Community psychology, theory, method and practice: South African and other perspectives*. Cape Town: Oxford University Press.

Shore, J. H., Tatum, E. L. & Vollmer, W. M. (1986). "Psychiatric reactions to disaster: The Mount St Helens experience". *American Journal of Psychiatry, 143*, 590-595.

Shuttle, A. (1994). *Philosophy for Africa.* Cape Town: University of Cape Town Press.

Simonsson, B., Nilsson, K. W., Leppert, J., Diwan, V. K. (2010). *Biopsychosocial medicine*. [On-Line]. Available: www.bpsmedicine.com/content/2/1/4

Slaughter, B. (2007). *Twelve die in South African Gold Mine*. [On-Line]. Available: www.wsws.org /images/back.gif… [2007, April 15]

Smallegan, M. (1989). Level of depressive symptoms and life stressors for culturally diverse older adults. *The Gerontologist, 29*, 45-51.

Staines, M. M. (2000). *Factors mediating the level of vicarious traumatization and compassion satisfaction*. Unpublished masters thesis, University of KwaZulu-Natal, Pietermaritzburg.

Stein, E. & Eisen, B. (1996). Helping trauma survivor cope: Effects of immediate brief co-therapy and crisis intervention. *Crisis Intervention, 3*, 113-127.

Strauss, A. & Corbin, J. (1990). *Basics of qualitative research: Grounded theory procedure and techniques*. London: Sage Publishers.

Strumpfer, D. J. W. (2003). Resilience and burnout: A stitch that could save nine. *South African Journal of Psychology, 33*(2), 69-79.

Swanepoel, B., Erusmus, B., van Wyk, M. & Schenk, H. (2003*). South African human resource management: Theory and practice* (3rd ed.). Cape Town: Juta.

Tagar, Y. (2007). *Persephone institute of psychophonetics*. [On-Line]. Available: www.philophonetics.com [2007, April 20]

Terblanche, R. (2007). *Managing trauma of community violence and workplace accidents in South Africa.* [On-Line]. Available: www.u:ac.za/dspace/bitstream/2263/3316/1/Maiden_Managing (2006).pdf- [2007, June 7]

Terre Blanche, M. & Durrheim, K. (1999). *Research in practice: Applied methods for social sciences.* Cape Town: University of Cape Town.

van Niekerk, D. A. (1997). *Trauma-related psychiatric symptoms in South African policemen*. Unpublished masters thesis, Rand Afrikaans University, Johannesburg.

van Zyl, E. S. (1996). The experience of stress in a group of lower level black and white Employees involved in manual tasks. *South African Journal of Economics and Management Sciences, 18,* 118-133.

Wikipedia, the free encyclopedia (2009). *Post-Traumatic Stress Disorder.* [On-Line]. Available: http://209.85.229.132/search?q=cache:-71wex4nWAUJ:en.wikipedia.org/wiki/Post-tra [2008, October 24]

APPENDIX A

Research Questions (English Version)

Can you briefly tell me about your experiences as underground mineworkers since you started?

- What are your most difficult moments that you have experienced at work?
- Are there any psychological symptoms by which you identify people who are affected by traumatic experiences at work?
- Are there any measures and systems by which you manage the presented symptoms?
- What do you think can be done to manage traumatic incidents at work and effects they have on you as workers?

APPENDIX B

Imibuzo Yocwaningo

Ngicela ungitshele kabanzi ngendlela ozizwa ngayo njengomsebenzi wasemgodini wemayini kusukela uqala ukusebenza kuze kube manje.

- Yiziphi izikhathi ezinzima oke uhlangabezane nazo futhi uzicabange emsebenzini wakho usemgodini?
- Yiziphi izimpawu enizibonayo uma omunye wabasebenzi enenkinga ehambelana nengqondo ngenxa yobunzima ahlangabezana nabo emsebenzini?
- Zikhona yini izindlela enizisebenzisayo ukusiza labo abakhombisa ukuthinteka engqondweni?
- Nibona ukuthi izingozi zingagwemeka kanjani emsebenzini wenu futhi basizwe kanjani labo abathintekile engozini yasemgodini?