Original article

The influence of psychological resources on mineworkers' levels of burnout in a remote and isolated mining town in South Africa

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A B S T R A C T

The long-term effects of job stress can damage mineworkers' psychological and relationship well-being and lead to burnout. But workers do not react only passively to the work environment: by accessing their internal (personal) resources they can actively influence the environmental and work demands that may lead to burnout. This exploratory study investigated the role of two psychological resources, psychological capital (PsyCap) and mindfulness, in reducing the likelihood of burnout and improving psychological well-being in a sample of 238 mineworkers in Postmasburg, a remote location in South Africa. In general, the mineworkers had fairly low levels of burnout and high levels of both PsyCap and mindfulness. A statistically significant negative relationship was found between burnout and all the components of PsyCap (self-efficacy, optimism, hope and resilience), and between burnout and mindfulness. High levels of hope and mindfulness were found to be statistically significant predictors of lower levels of burnout in this sample. The findings suggest that using these personal resources more effectively is likely to improve employee well-being, to the benefit of both the individual and the organisation.

1. Introduction

South Africa's development and economy have always been associated with the mining industry. Its abundant resources – gold, platinum, iron, chrome, manganese, to name but a few – make it one of the world's top mineral suppliers. The country experienced extraordinary growth from the 1880s onwards, mostly due to gold. But in recent years the fall in the gold price and the increased costs of production and labour have curtailed production and consequently the country's development (Marais et al., 2018; Binns and Nel, 2001). Considerable research has been done on the impact of mine downscaling and closure in South Africa, and suggestions have been made on how to revitalise the affected local economies (Marais, 2013; Harington et al., 2004; Binns and Nel, 2001). Although South Africa's economy is no longer dependent on mining, the industry still matters for the country's economy and its social fabric (Marais et al., 2018, p. 13).

Mining in South Africa has moved geographically to the periphery of the country (Marais et al., 2018). The mining companies are a major source of employment for local communities, especially as they are mainly rural, remote and isolated. The mining industry in South Africa is known for its historical use of migrant labour (Pilossof and Burger, 2018; Harington et al., 2004; Crush, 1992), usually entailing 12 months

of work with breaks at Easter and Christmas. Australia, and other countries, have introduced new forms of migrant work, such as FIFO (fly-in-fly out), DIDO (drive-in-drive out), BIBO (bus-in-bus out) and SISO (ship-in-ship-out) (Australian Institute of Management, 2013). But post-apartheid South Africa has opted rather to create on-site individual family housing for mineworkers (Marais and Cloete, 2013, p. 83). Also, despite the increase in outsourcing by South African mining companies, nearly 30% of whose mineworkers are contract workers (Marais et al., 2018), many mining companies still employ mineworkers directly and current government policy encourages permanent settlement in mining towns (Ntema et al., 2017).

Under South Africa's new democratic dispensation the mining industry's traditional labour management practices, often coercive and unsophisticated (Webster and Omar, 2003; Malherbe and Segal, 2000), have had to change. But much work remains to be done in the post-apartheid mining environment: workplace and management practices need to be transformed; cultural, linguistic, ethnic and racial problems need to be resolved; and effective forms of interpersonal conflict resolution need to be found (see Kotzé and Nel, 2018 for an overview). Many mineworkers are suffering from excessive demands to increase output, as the companies, with fewer employees to meet production targets, are impelled to achieve more, reduce working costs and

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increase profits (Phakathi, 2011; Yu and Chen, 2013; Chen et al., 2015). And the pressure to meet rigorous production targets in order to qualify for bonuses adds to the stress (McLean, 2012; Chimamise et al., 2013).

As an extraction industry, using potentially dangerous tools and equipment, mining worldwide has more inherent risks than other sectors and some of the highest incidences of accidents and occupational disease (Kasap, 2011; Amponsah-Tawiah et al., 2013). All these factors pose a threat to mineworkers in an environment where business rewards are often regarded as more important than their psychological well-being.

Shift work, long working hours, long-distance labour commuting, excessive workloads and poor living conditions have all been found to increase fatigue, stress and burnout and threaten workers' psychological and relationship well-being (Takahashi et al., 2006; Sharma and Rees, 2007; Sharma, 2008; Lovell and Critchley, 2010; Bowers, 2011; McLean, 2012; Ryser et al., 2016; Jimenez and Dunkl, 2017). In a study of Canadian workers, shift workers reported significantly higher levels of job stress, emotional exhaustion and burnout than workers on a regular day schedule (Jamal, 2004). Mineworkers in an Australian study regarded stressful tasks and a general feeling of burnout as negative aspects of their work (McLean, 2012). A study of the Ghanaian mining industry found that heavy work demands and a feeling of a lack of control over work decisions had a negative effect on employees' health and well-being (Amponsah-Tawiah et al., 2013). Difficult working conditions and extended periods of increased production at a South African coal-mine were found to be conducive to burnout (Roets, 2004). In a sample of 199 employees in the South African mining industry, more work overload and less chance of promotion predicted burnout (Van der Walt, 2008).

Workers in remote peripheral locations may, additional to the above, have to struggle with problems of isolation from friends and family, lack of support networks, environmental extremes and a stressful workplace (Malherbe and Segal, 2000). It has been shown that those mineworkers in remote areas who experience work stress, may use certain strategies to cope with these stressors. Underground coalminers in Serbia who used proactive coping strategies such as autonomous goalsetting and self-regulatory goal attainment cognition and behaviour exhibited only low levels of burnout (Manic et al., 2017). Those who struggle to balance work and family demands could cope by capitalising on social support from family and friends (McTernan, 2016).

Job burnout has serious consequences for both the company and the employee. Employees with higher levels of burnout are more likely to report physical health problems such as sleep disturbance, anxiety, depression and neck pain (Peterson et al., 2008), as well as psychological problems including withdrawal behaviour that manifests as lateness, absence or turnover (Hanisch, 1995; Maslach et al., 2001). Job burnout is also related to lower levels of job satisfaction and job performance (Akerstedt, 1990; Kwag and Kim, 2009). Bakker and Costa (2014) suggest that a possible explanation for the negative link between burnout and performance may be that exhausted employees struggle to keep focused on a task and therefore tend to make more mistakes. Employee burnout increases absenteeism, staff turnover and accident rates and decreases commitment and productivity: all bad news for the company (Harter et al., 2002; Schaufeli and Bakker, 2004; Sieberhagen et al., 2009).

The work-related psychological well-being of employees directly affects their life satisfaction and ultimately spills over onto the community (Iverson and Maguire, 1990). As significant employers in local communities, mining companies influence the safety, health and social life of not only their workers but also their workers' families and the whole community (Abrahamsson et al., 2014). The mineworkers' stressful job situation is 'reflected in high levels of emotional exhaustion and [the] need for recovery' and in their mental connection to their job during leisure time (Sonnentag et al., 2010, p. 363). Inability to detach themselves from the demands of the job after hours can mean they pass

on their own job stressors and poor individual well-being to the family and the community.

2. What is burnout and how can it be prevented?

Burnout is a result of accumulated and long-term adverse effects of job stress and is often regarded as a chronic stress reaction. Bakker and Costa (2014, p. 117) define it as 'a combination of chronic exhaustion and negative attitude toward work with damaging consequences for employee health and productivity'. The continuous exhaustion leads to cynicism about the value of one's work and eventually doubt about one's capacity to perform. Burnout is therefore described as being made up of three separate but interrelated constructs – emotional exhaustion, cynicism and reduced personal accomplishment (Maslach et al., 1996, 2001). Rothmann (2008) says it is becoming increasingly clear that emotional exhaustion and cynicism constitute the core of burnout.

The job demands-resources (JD-R) model (Bakker and Demerouti, 2007) is often used as a framework for work well-being research. This model assumes that every occupation has specific stresses that are caused by job demands and mitigated by job resources. Job demands are the physical, psychological, social or organisational aspects of the job that require sustained physical or psychological effort and have physical or psychological costs, such as work overload and emotionally demanding interactions with clients. Job resources are the physical, psychological, social or organisational aspects that stimulate personal growth and help to achieve work goals and thus mitigate job demands (Bakker and Demerouti, 2007). Job resources can derive from the organisation, social relations, the way work is organised, and the task itself (Herbert, 2011), and, if experienced positively, can motivate the employee and improve employee well-being (Bakker and Demerouti, 2007). Personal resources, such as self-efficacy, optimism, hope and resilience, and positive self-evaluation of one's ability to affect and control one's environment, can improve employees' perceptions and use of job resources (Hobfoll et al., 2003; Bakker and Demerouti, 2007; Herbert, 2011).

Both external and internal factors (weaknesses in job and personal resources) play a role in the development of burnout (Demerouti et al., 2001; Kwag and Kim, 2009; Guo et al., 2015). Chen et al. (2012) reformulated the framework of job burnout antecedents to distinguish three root causes: organisational weakness-caused burnout (such as systems, resources and context), work weakness-caused burnout (such as job type and workload), and individual characteristic-caused burnout (such as personality and demographics). Zamini et al. (2011) found that, of all organisational cultures, a participative organisational culture has the lowest level of job burnout. Jimenez and Dunkl (2017) found that work overload and lack of rewards were the most important predictors of burnout. Work overload prevents employees from recovering properly from physical and emotional exhaustion, and a lack of rewards (financial or non-financial) can lead to feelings of meaninglessness, inefficacy and, subsequently, cynicism (Cartwright and Holmes, 2006; Sonnentag et al., 2010). Chen et al. (2015) say that, should both job and personal resources be inadequate to enable employees to cope with their workload, this results in the exhaustion and pessimistic attitudes and behaviours that form part of job burnout.

Employees themselves play a role in the daily process that may lead to burnout. They do not only react passively to the work environment but can actively influence or negotiate the environmental and work demands (Bakker and Costa, 2014). In the same working conditions some employees are more likely than others to experience burnout (Chen et al., 2012). Individual deficiencies of characteristics such as resilience, conscientiousness and 'agreeableness' are related to burnout (Kotzé and Lamb, 2012).

Wright and Hobfoll (2004) found that individuals evaluate the availability of the resources that directly influence their levels of well-being. When they think they have access to internal resources that can help them deal with the challenges they face, they are more likely to

experience well-being, even in the face of adversity. In the early 2000s, research on employee well-being shifted towards a positive psychology – focusing on psychological resources that enhance mental well-being and lead to optimal functioning and can be measured, developed and effectively managed to improve performance (Luthans, 2002; Seligman and Csikszentmihalyi, 2000).

3. Psychological resources influencing employee burnout levels

Psychological capital (PsyCap) and mindfulness are two cognitive resources employees can use to improve their overall levels of well-being. Several studies in various industries in different countries support the view that these resources mitigate the effects of job demands and stressors and therefore help prevent burnout. Among the samples in these studies are iron and steelworkers in Anshan, China (Guo et al., 2015), staff members at a Midwestern University in the United States (Avey et al., 2010), employees at various service, manufacturing and financial institutions in Singapore (Reb et al., 2012), participants from various organisations such as shops, nursing homes, hospitals, and schools in the Netherlands and Belgium (Hülsheger et al., 2013), school teachers at various urban schools in Canada and the United States (Roeser et al., 2013), and CEOs, middle and junior managers and entrepreneurs in both rural and urban areas in New Zealand (Roche et al., 2014). No studies relating PsyCap to burnout in the mining industry could be found.

3.1. Psychological capital (PsyCap) and its relationship with burnout

PsyCap is regarded as a higher-order, core-positive factor indicated by four recognised, psychometrically proven constructs: *self-efficacy*, *optimism*, *hope and resilience*. *Self-efficacy* means having the confidence to take on challenging tasks and the ability to put in the necessary effort to succeed. *Optimism* means having a 'positive outcome outlook' – expecting to succeed now and in the future, and evaluating one's chances realistically. *Hope* means a 'positive emotional state' that includes the will to stay focused on accomplishing pre-determined goals and redirecting pathways when necessary in order to achieve these goals. *Resilience* means being able to 'bounce back' after setbacks and sustain one's performance despite problems (Luthans et al., 2007, 2008, 2015; Avey et al., 2010; Norman et al., 2010). PsyCap, as an example of a higher-order construct made up of these four distinct lower-order constructs, is prevalent in organisational behaviour research. PsyCap is also regarded as a "state-like" construct, meaning that it is 'relatively malleable' and 'more open to change and development' than '"trait-like" constructs' such as personality dimensions or character strengths (Luthans et al., 2007, p. 544).

Self-efficacy, optimism, hope and resilience share certain commonalities, such as positive appraisal of circumstances, a sense of control, 'agentic goal pursuit', intentionality, and a tendency to choose challenging goals and to be motivated to achieve them (Luthans and Youssef-Morgan, 2017). Resilience is often regarded as a reactive mode – a response to a setback – while self-efficacy, optimism and hope are proactive. Avey et al. (2010), however, see resilience as sharing certain characteristics with the other three. Resilience and self-efficacy have an underlying element of perseverance that gives a person endurance in the face of obstacles. Resilience and hope are inherently adaptational as they relate to recovering from setbacks. Resilient people adapt in order to draw on their assets, while hopeful people generate alternative pathways. To summarise: individuals with high levels of PsyCap draw on their past experiences of being optimistic to give them persistence in the present, through self-efficacy and resilience, and eventually to influence their future through hopeful pathways. Ultimately, such positive appraisals are likely to increase well-being (Youssef-Morgan and Luthans, 2015). Therefore, PsyCap can be developed as a personal resource to enhance work outcomes and increase psychological well-being.

In a study including permanent employees and support staff of a construction company, Herbert (2011) found that hope, optimism, self-efficacy and resilience (and the PsyCap total score) were associated with lower levels of burnout. Herbert (2011) says that PsyCap can buffer the development of burnout over the long term by lessening stress and thus preventing subsequent burnout. Hansen et al. (2015) found that when educators' levels of PsyCap are higher, their levels of emotional exhaustion are lower. In a study of bank employees, Li et al. (2015) found that PsyCap is a mediator between occupational stress and job burnout and they state that it 'may be a potential positive resource in reducing the negative effects of occupational stress on job burnout' (p. 2985). Mindfulness has also been found to protect individuals' from workplace stressors and increase psychological well-being.

3.2. Mindfulness and its relationship with burnout

Mindfulness, rooted in Eastern contemplative traditions (Shapiro et al., 2006, p. 374), is defined differently by different schools of thought (Brown et al., 2007). It can be simply defined as 'a state of consciousness in which attention is focused on present-moment phenomena occurring both externally and internally' (Dane, 2011, p. 4). Mindfulness is regarded as an inherent human capacity but also as a learnable skill. Therefore, because of dispositional tendencies, some people may be in a mindful state of consciousness more often than others and various authors agree that mindfulness can be developed and enhanced through training (Brown and Ryan, 2003; Dane, 2011; Leroy et al., 2013).

Mindfulness has applications in the workplace, where it is regarded as a cognitive construct that relates to 'the degree to which one's attention tends to be focused on a wide breadth of events unfolding in one's work context' (Dane and Brummel, 2013, pp. 7, 8). Glomb et al. (2011) developed a model linking mindfulness to several outcomes via core and secondary mental and neurobiological processes. Mindfulness affects the core processes in three ways: by 'decoupling' the self from 'events, experiences, thought, and emotions'; by decreasing the automaticity of 'mental processes in which past experiences, schemas, and cognitive habits constrain thinking'; and by increasing 'awareness and regulation of physiological systems' (Glomb et al., 2011, p. 124).

Mindfulness affects self-regulation by creating a separation between the self and experiences, events and emotions and by helping a person to observe external and internal stimuli objectively. It creates a distance between the person (and their self-worth) and their experiences, emotions and thoughts. It works by reducing the automatic mental processes that diminish present-moment awareness, intent and control. These processes are evident when, for example, a person responds to others without really paying attention to the conversation because the conversational outcome is pre-empted. When employees practise mindfulness, the automaticity of their thought processes is interrupted and they can experience 'what is' and not a story about what is. Malinowski and Lim (2015, p. 1262) say that mindful individuals 'tend to experience challenging situations in a more flexible and less impulsive way'. Glomb et al. (2011) say that mindfulness influences self-regulation by creating bodily awareness leading to physiological regulation. This in turn helps the individual to better interpret and respond to messages from the body. Employees can thus generate feelings of calm and connection rather than anger and anxiety, and physical and psychological well-being rather than burnout.

Besides the core processes, Glomb et al. (2011) identify seven secondary mental and neurobiological processes by which mindfulness-based practices improve employee functioning: decreased rumination, greater empathy, increased self-determination and greater persistence, increased response flexibility, enhanced working memory, greater accuracy in affective forecasting, and improved affective regulation. They suggest that the core and secondary processes form pathways by which mindfulness and mindfulness-based practices lead to improved self-

regulation of thoughts, emotions and behaviour, and better employee functioning. Malinowski and Lim (2015) also found that work well-being was influenced by non-reacting and non-judging, suggesting that the ability to refrain from reacting will lead to a more positive and realistic outlook on life. Therefore, mindfulness, especially the way employees focus their attention, influences workplace behaviours such as decision making and risk taking (Bazerman and Watkins, 2004), strategic decision making (Nadkarni and Barr, 2008), work engagement (Leroy et al., 2013; Depenbrock, 2014), and burnout (Piatkowska, 2014; Gustafsons et al., 2015; Malinowski and Lim, 2015).

Mindfulness also promotes positive social relations by means of empathy, affective regulation, persistence and response flexibility (Roche et al., 2014) which 'allows enhanced sensitivity to others' signals *without subsequent reactivity*' (Glomb et al., 2011, p. 139, original emphasis) Hutcherson et al. (2008) have shown that mindfulness training can increase social connectedness. It can help employees regulate affect and reactivity and thus enable them to approach others positively and protect them from other employees' negative emotional states. Employees with a mindful orientation tend to be more accepting of others and their imperfections and less judgmental about cultural differences. Embedded in these positive workplace relationships are essential resources that protect employees from workplace stressors and foster positive behaviours in the workplace.

The above review of the literature suggests that individuals who possess the positive psychological capacities of PsyCap and mindfulness will have a better chance of coping with stress and avoiding burnout. Yet, although a meta-analysis by Avey et al. (2011) found support for the long-term relationship between PsyCap and well-being, it also found that the outcomes of PsyCap are not necessarily consistent across contexts and that PsyCap may play a more significant role in studies conducted in the United States than in other countries. It also found that the relationship between PsyCap and its outcomes is stronger in the service sector than in the industrial sector. No research could be found which has investigated these personal capacities in relation to burnout in the mining environment in South Africa.

4. Purpose and context of the study

4.1. Purpose

In South Africa since 1994 political and economic changes and changes in labour legislation have changed the work environment in the mining industry. Some changes, such as better health and safety legislation, have improved the workplace for mineworkers but others have made it more pressurised and insecure (Phakathi, 2011). Concern has been expressed about the lack of understanding about mental health and well-being in South Africa's mining and resource sectors (Brand-Labuschagne, 2010; Bowers, 2011). While industrialised countries prioritise psychosocial stressors, developing countries focus more on physical danger and heavy work and mostly lack legislation for employees' psychological well-being. And in South Africa, as elsewhere, socially sustainable development outside the mine tends to be investigated more often than the psycho-social work environment in mining (Sieberhagen et al., 2009; Abrahamsson et al., 2014).

The purpose of this exploratory study was to investigate the way the psychological factors mindfulness and PsyCap can keep mineworkers on track and in pursuit of their work goals and prevent burnout, despite the stressful nature of their workplaces and the many difficulties they encounter.

4.2. Postmasburg: the context of the study

Postmasburg is a small community in a remote part of South Africa, an isolated peripheral location 'in which mining increasingly plays an economic and societal role' (Marais et al., 2018, p. 13). It is situated in the Northern Cape more than five hours' drive from South Africa's economic heartland, Gauteng, and about 400 km from Bloemfontein, the nearest metropolitan municipality. The Northern Cape is sparsely populated and dry and occupies land that belonged historically to the indigenous San (formerly known as Bushmen) (Tarras-Wahlberg et al., 2017). The global demand for iron ore has turned Postmasburg into a relatively large mining town. Although it is technically classified as an 'urban community', it has a rural character because of its isolated, peripheral location. (In South Africa a community may only be classified as 'rural' if it is not located on proclaimed urban land).

In the Postmasburg area there are several highly mechanised opencast iron-ore mines. Between 2001 and 2011 iron ore production rose, along with the prices, which improved labour market outcomes for the local municipality. The share of workers in the mining and quarrying industry increased from 10.7% to 12.7% during this period, the labour absorption rate increased by more than 13 percentage points, the official unemployment rate decreased by more than 13 percentage points, and the labour force participation rate increased by more than 8 percentage points (Burger and Geldenhuys, 2018). A household survey conducted between October 2015 and February 2016 in Postmasburg (Burger and Geldenhuys, 2018) showed that Postmasburg mineworkers, on average, were earning higher monthly wages (R11,583.98 versus R4716.566) and working more hours per week (32.69 versus 30.24) than non-mineworkers in Postmasburg, and that mine-employed workers were earning higher wages per month (R15,667.92 versus R6106.843) and working more hours per week (35.31 versus 25.02) than contractor mineworkers. Yet a comparison between the per capita income and expenditure levels (or poverty levels) of mine-employed and contractor mineworker households found fewer differences between these two groups. The main reasons for this, according to Burger and Geldenhuys (2018), were that contractor mineworker households were smaller, had fewer dependants, and received more income from grants.

5. Methods

5.1. Sample

The present study was undertaken at two of Postmasburg's open-pit iron-ore mines. Fieldworkers collected useable data from 238 mineworkers. Approximately 55% were technical operators (drillers, heavy machinery operators, dump and haul truck operators), 13% were general workers in the plant, 8% were administrators (equipment controllers, maintenance planners), 7% were artisans (diesel mechanics, boilers, fitters, welders), and 6% were team leaders and supervisors. The rest were occupied as, for example, engineers, health and safety officers, security officers, quality controllers and drivers. Although issues such as benefit sharing, worker development and worker participation still remain a cause for concern in the post-apartheid mining regime (Phakathi, 2011; PWC, 2014), these two mines not only offer relatively high salaries to the mineworkers, but also have a more 'enlightened approach' where employees receive benefits such as bonuses, medical aid and pension (Kotzé and Nel, 2018). Both mines use shift work, with 12-h shifts being the norm. Most of the mineworkers (73%) involved in the present study said Postmasburg was their home – they had not migrated there for work – and 68% said they were permanently employed. Participants represented the following language groups: indigenous African languages including Setswana, Sesotho, IsiZulu and IsiXhosa (61.8%), Afrikaans (33.2%), and other languages (5%). Three quarters of the sample (75%) had completed some primary and secondary school education, and 50% had completed Grade 12. The sample was 83% male and the average age was 37.

5.2. Measurement

PsyCap was measured using the PsyCap Questionnaire (PCQ-24) (Luthans et al., 2007), and burnout was measured using nine items from

the Maslach Burnout Inventory (Maslach et al., 1996). Following Rothmann (2008), this study measured burnout using two core components: emotional exhaustion and cynicism. Mindfulness was measured using the 15-item Mindful Attention Awareness Scale (MAAS) (Brown and Ryan, 2003).

5.3. Data analysis

Pearson's Product Moment Correlation and Stepwise Multiple Regression were used to determine the influence of PsyCap and mindfulness on burnout (Field, 2005). Cronbach's alpha was used to determine the reliability of the two measuring instruments. Reliability estimates of 0.7 and higher indicate good reliability. However, estimates as low as 0.6 may be acceptable when conducting exploratory research (Hair et al., 2006: pp. 137, 778). The Cronbach's alpha for the PsyCap Questionnaire (with its 24 items) had a good reliability score of 0.82 and the nine items used to measure burnout had a good reliability score of 0.90. Finally, the 15 items measuring mindfulness had a good reliability score of 0.92.

6. Findings

6.1. Overall levels of burnout, mindfulness, and PsyCap

The study found (Table 1) that the mineworkers have fairly low levels of burnout, as indicated by their low average score on the measure in question. In contrast, they scored fairly high on the independent variables (PsyCap and mindfulness). In short, they seem to have high levels of both PsyCap and mindfulness.

6.2. Correlations between independent variables (PsyCap and mindfulness) and burnout

Table 2 shows that in this sample of mineworkers the independent variables (PsyCap and mindfulness) had significant negative correlations with burnout. Notably, mindfulness had the strongest negative correlation with burnout ($r = -0.413$) and self-efficacy had the weakest correlation with mindfulness ($r = -0.149$).

6.3. Stepwise multiple regression: predictors of burnout

Table 3 shows that there were only two significant predictors of burnout in this sample of mineworkers: mindfulness ($\beta = -0.464$, $p = 0.000$) and hope ($\beta = -0.188$, $p = 0.001$). This regression model was statistically significant ($F = 43.912$, $p = 0.000$) and explained 28% of the variance in burnout. More specifically, mindfulness contributed 25% and hope 3% of the variance in burnout.

7. Discussion

7.1. Burnout, PsyCap, and mindfulness among mineworkers

Given the demands placed on employees who work for mining companies, the study expected to find some degree of burnout among this sample of mineworkers. But, contrary to expectations, they had

Table 1
Descriptive statistics (n = 238).

Variable	Minimum	Maximum	Average	Standard Deviation
Burnout	0	7	2.263	1.366
Mindfulness	0	6	5.235	0.947
Self-efficacy (PsyCap)	0	6	4.876	0.804
Optimism (PsyCap)	3	6	4.408	0.546
Hope (PsyCap)	0	6	4.817	0.7551
Resilience (PsyCap)	2	6	4.574	0.664

Table 2
Correlations between burnout and the dependent variables (PsyCap and mindfulness, n = 238).

Variable	Pearson's Product Moment Correlation
Mindfulness	−0.413[**]
Self-efficacy (PsyCap)	−0.149[**]
Optimism (PsyCap)	−0.270[**]
Hope (PsyCap)	−0.195[**]
Resilience (PsyCp)	−0.173[**]

** $p < 0.01$.

Table 3
Significant predictors of burnout (Stepwise Multiple Regression, n = 238).

Variable	Standardised beta coefficients
Mindfulness	−0.464[**]
Hope (PsyCap)	−0.188[**]

** $p < 0.01$.

fairly low levels of burnout. In addition, they exhibited high levels of mindfulness, which means that they had the ability to focus their attention on events unfolding in their work context (Dane and Brummel, 2013) and to stay aware of present situations and experiences (Brown and Ryan, 2003). They also had high levels of PsyCap, but not as high as their levels of mindfulness. As regards PsyCap components, their levels of self-efficacy and hope were higher than their levels of optimism and resilience. This shows that they had confidence in their ability to take on challenging tasks and to put in the necessary effort to succeed. They also had a sense of goal-directed determination (Snyder et al., 1991) that helped them to stay focused on their work goals and to find alternative ways to face challenges and overcome obstacles in the pursuit of these goals (Luthans et al., 2015).

7.2. Relationship between PsyCap and burnout

The study found that the components of PsyCap (self-efficacy, optimism, hope and resilience) had statistically significant negative correlations with this sample of mineworkers' levels of burnout, i.e. the higher their levels of PsyCap, the lower their levels of burnout. Therefore, PsyCap appears to be a resource (i.e. capacity) that employees can use to mitigate the influence of stress on their levels of burnout (Avey et al., 2010; Bakker and Demerouti, 2007). These results are in line with previous research, in the banking industry in China (Li et al., 2015) and in a construction company in South Africa (Herbert, 2011), that found that PsyCap was associated with lower levels of burnout and that it can reduce the effects of occupational stress on job burnout.

The present study also found that hope (one of the components of PsyCap) predicted lower levels of burnout, and vice versa. Previous research has shown that when hope is low, the lack of agency and the failure to create alternative pathways can make people feel they are unlikely to achieve their goals. Employees with lower levels of hope also tend to experience more negative emotions, and more frustration and stress at work, and may struggle with feelings of hopelessness. They therefore focus on failure rather than success and this may subsequently result in cynicism (see Avey et al., 2010; Snyder et al., 1991; Snyder, 1994). In contrast, previous research has shown that hopeful employees are likely to pay less attention to the negative aspects of their job and to focus on its positive outcomes (Sherwin et al., 1992). Hopeful people experience fewer negative emotions and less frustration and stress at work, even when faced with obstacles. Hopeful employees therefore tend to tackle rather than avoid goals, which can help reduce cynicism and make them less likely to experience burnout due to negative emotions and experiences (Gustafsson et al., 2010).

7.3. Relationship between mindfulness and burnout

For this sample of mineworkers, mindfulness had the strongest influence on their levels of burnout. Mindfulness had the strongest correlation ($r = -0.413$) with burnout and also explained 25% of its variance. These results are in line with previous research that found that mindfulness has a negative, statistically significant correlation with burnout (Di Benedetto and Swadling, 2014) and, more specifically, emotional exhaustion (Krasner et al., 2009; Hülsheger et al., 2013; Reb et al., 2012). Krasner et al. (2009) suggest that when individuals are more self-aware in relation to the events unfolding in the work context, while focusing their attention on the present-moment phenomena (key characteristics of mindfulness), they are likely to be more attuned to the sources of stress that may lead to burnout as well as their own capacity to deal with stress. Therefore, mindfulness seems to protect and defend individuals against possible burnout (Di Benedetto and Swadling, 2014).

Personal resources do not exist in isolation. Hobfoll (2002) uses the term 'resource caravans', to describe the way that psychological resources, as Luthans and Youssef-Morgan (2017, p. 343) put it, 'may travel together and interact synergistically to produce differentiated manifestations over time and across contexts'. According to Hobfoll (2002), resource caravans are likely to increase individuals' beliefs in their capabilities. In other words, those who are both mindful and have high levels of PsyCap are more likely to enhance their well-being in the workplace and reduce their chances of burnout. PsyCap and mindfulness can strengthen individuals' belief that they have what it takes to succeed (self-efficacy), and help them remain optimistic, hopeful and resilient despite adversity (Bandura, 1986).

On the basis of the results of the present study it seems that this group of mineworkers in Postmasburg do possess the personal resources of mindfulness and PsyCap, and especially hope, to offset the possible negative influence of stressful emotions that often lead to burnout (Hülsheger et al., 2013). By using these personal resources effectively they seem to increase their psychological well-being to the benefit of both the individual and the organisation.

8. Concluding comments

Work stress has been shown to be a major cause of burnout in the workplace. For employees to deal successfully with the challenges and demands placed on them by the nature of their work and their specific work context, they must use various job-related and psychological resources (Avey et al., 2010). A lack of access to resources has been found to influence employees' levels of burnout (Schaufeli and Bakker, 2004). Although this study was only explorative in nature it may have some implications for the mining industry. The results of the present study showed that the resources mindfulness and PsyCap may counteract burnout in a mining environment. Other studies have shown that mindfulness can improve safety behaviour in the mining industry. For instance, two South African researchers (Van Tonder and Groenewald, 2011) investigated the effect of both sense making and mindfulness on mining accidents in a platinum mine. Using qualitative data, they found that when employees are mindful of their surroundings they are less likely to be involved in accidents. Related research executed in a nuclear setting (Zhang and Wu, 2014) found that mindfulness predicted safety behaviours (compliance and participation). The findings of the literature therefore suggest that mindfulness training (involving both employees and managers) is likely to have a positive effect on the safety culture of a mine.

Both PsyCap and mindfulness are learnable and can be developed through various relatively short workplace interventions (Brown and Ryan, 2003; Hodges, 2010; Leroy et al., 2013). Previous research has shown that PsyCap and mindfulness-based practices can add value to organisational health and well-being programmes. Although the organisational context plays a critical role in hindering or enhancing the

development of human capacities such as PsyCap and mindfulness (Avey et al., 2010), it may be worthwhile for mining companies to design and facilitate interventions to develop their workers' PsyCap and mindfulness as part of their safety training and well-being programmes. They might also consider measuring the levels of PsyCap and mindfulness of applicants for certain jobs, as part of an integrated psychometric assessment battery linked to the required job competencies. However, more research on the effect of PsyCap and mindfulness on several work outcomes in the mining environment should be done, so as to offer guidance to the mining industry on how to capitalise on the psychological resources of its employees.

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