

# **Sense of coherence, coping and burnout in an electricity supply organisation**

L J Steyn, Hons. B.Soc. Sc

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**Supervisor:** Prof. S. Rothmann

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## COMMENTS

The reader is reminded of the following

- The references as well as the editorial style as prescribed by the *Publication Manual (4<sup>th</sup> edition)* of the American Psychological Association (APA) were followed in this dissertation. This practice is in line with the policy of the Programme in Industrial Psychology of the PU for CHE to use APA style in all scientific documents as from January 1999.
- The mini-dissertation is submitted in the form of a research article. The editorial style specified by the *South African Journal of Industrial Psychology* (which agrees largely with the APA style) is used, but the APA guidelines were followed in constructing tables.

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## ABSTRACT

**Title:** Sense of coherence, coping and burnout in an electricity supply organisation

**Key terms:** Sense of coherence, coping, burnout, job stress, validity, reliability, engineers, technicians, electricians.

The relationships that people have with their work, and the difficulties that can arise when those relationships turn sour, have been long recognised as a significant phenomenon of the modern age. The use of the term *burnout* for this phenomenon began to appear with some regularity in the 1970s in the United States, especially among people working in the human services. Burnout can be expected amongst engineers, technicians and electricians, due to the integration of their work activities and the quality of support received from their supervisors or managers as well as from other departments. Front line staff can be expected to experience higher levels of burnout, because of their direct contact with difficult customers (cut-offs due to non-payments, for instance), certain job demands (restoration of power interruptions), staff shortages, training of new staff, and so on. The objective of this study was to determine the relationship between burnout, job stress, sense of coherence and coping of engineers, technicians and electricians in a South African electricity distribution organisation.

A cross-sectional survey design was used. The study population consisted of 38 engineers, 86 technicians and 91 electricians. Four questionnaires were used, namely the Maslach Burnout Inventory - General Survey, a Job Stress Questionnaire, the Orientation to Life Questionnaire and COPE. Descriptive and inferential statistics were used to analyse the results.

The results showed that stress because of job demands, lack of support, supervision and transformation, as well as a weak sense of coherence predicted exhaustion. Exhaustion and avoidance predicted cynicism. A causal sequence was found between sense of coherence, job stress and exhaustion. Active coping moderated the effect of sense of coherence on professional efficacy. Employees with a lower job grade show higher levels of cynicism and lower levels of professional efficacy compared with those with a higher job grade. An explanation might be that the lower job grades lack the necessary coping skills. Therefore, it seems that employees who have a weak sense of coherence are inclined to suffer from job

stress, which will lead to exhaustion. Sense of coherence and the use of active coping strategies seem to contribute to the professional efficacy of employees, which may lead to health-enhancing behaviours and better social adjustments.

Job stress impacts on exhaustion and sense of coherence, and a strong sense of coherence moderates the effects of job stress on exhaustion. Sense of coherence also protects employees from developing low professional efficacy. Active coping strategies moderate the effects of sense of coherence on professional efficacy. Avoidance as a coping strategy mediated the relationship between sense of coherence and cynicism.

Recommendations for future research were made.

## OPSOMMING

**Titel:** Koherensiesin, coping en uitbranding binne 'n elektrisiteitsverspreidingsorganisasie.

**Sleuteltermes:** Koherensiesin, coping, psigiese uitbranding, werkstres, geldigheid, betroubaarheid, ingenieurs, tegnikuste, elektrisiëns

Die verhouding van werkers met hul werk, en die probleme wat ontstaan indien hierdie verhouding suur raak, word lank reeds in die moderne era as 'n merkwaardige verskynsel erken. Die gebruik van die term *uitbranding* as verskynsel het in die jare 1970's in Amerika gereeld na vore gekom, veral onder mense werksaam in die menslike dienste sektore. Weens die integrasie van werksuitsette en die gehalte van ondersteuning van toesighouers, bestuurders en ander departemente, kan uitbranding onder ingenieurs, tegnikuste en elektrisiëns te wagte wees. Werknemers wat 'n hoër mate van uitbranding kan ervaar is diegene wat direk met ongelukkige klante (afsnydning weens wanbetaling, byvoorbeeld) in kontak kom, sekere werkseise (herstel van kragonderbrekings), tekort aan menslike hulpbronne, opleiding van nuwe werknemers, ens. Die doel van hierdie navorsing was om die verband tussen koherensiesin, coping, werkstres en uitbranding tussen ingenieurs, tegnikuste en elektrisiëns binne 'n Suid Afrikaanse elektrisiteitsverspreidingsorganisasie vas te stel.

'n Dwarssnee opname-ontwerp is gebruik. Die steekproef het bestaan uit 38 ingenieurs, 86 tegnikusse en 91 elektrisiëns. Die Maslach Uitbrandingsvraelys – Algemene Opname, 'n Werkstresvraelys, die Lewensoriënteringsvraelys en die COPE is as meetinstrumente gebruik. Beskrywende en inferensiële statistiek is gebruik om die resultate te ontleed.

Die resultate het getoon dat stres a.g.v. werkseise, gebrek aan ondersteuning, toesighouding en transformasie, asook 'n swak koherensiesin uitputting voorspel. Uitputting en vermyding het sinisme voorspel. 'n Oorsaaklike gevolg tussen koherensiesin, werkstres en uitputting was gevind. Aktiewe coping het die effekte van koherensiesin op professionele bekwaamheid gemodereer. Werknemers met 'n laer posgradering toon hoër vlakke van sinisme en laer vlakke van professionele doeltreffendheid in vergelyking met diegene met 'n hoër posgradering. 'n Verduideliking mag weens dat werknemers met 'n laer posgradering nie oor

die nodige coping vaardighede beskik nie. Dit blyk dus te wees dat werknemers wat oor 'n lae koherensiesin beskik geneig is om werkstres te ervaar wat tot uitputting aanleiding kan gee. Dit wil voorkom of koherensiesin en die gebruik van aktiewe coping strategieë 'n bydrae gelewer het tot die werknemers se professionele doeltreffendheid, wat tot die moontlike bevordering van gesondheidsgedrag en beter sosiale aanpassings aanleiding mag gee.

Werkstres het op uitputting en koherensiesin ingewerk, maar 'n sterk koherensiesin het die effekte van werkstres op uitputting gemodereer. Koherensiesin beskerm werknemers ook teen die ontwikkeling van 'n lae professionele doeltreffendheid. Aktiewe coping-strategieë het die effek van koherensiesin op persoonlike doeltreffendheid gemodereer. Vermydung as 'n coping-strategie het die verwantskap tussen koherensiesin en sinisme gemedieer.

Aanbevelings vir toekomstige navorsing is aan die hand gedoen.

# CHAPTER 1

## INTRODUCTION

This mini-dissertation investigates the possible relationships between the sense of coherence, coping, stress and burnout amongst engineers, technicians and electricians in a South African electricity distribution organisation.

This chapter focuses on the problem statement, objectives and basic hypothesis, as well as the research method.

### 1.1 PROBLEM STATEMENT

For continuous and sustainable economic growth in South Africa organisations need to invest in the psychological health and wellness of its human resources (Wise, 2001). The majority of organisations tend to believe that their responsibilities in terms of the health and wellness of their employees ends in the providing of a medical aid subsidy and employee assistance programmes. At the same time, customers of these organisations rightfully demand superior customer service and quality products or services (Williams, 2002). Customers are not afraid to vent their dissatisfaction directly to senior managers or even to the media. However, the “buck” always starts and ends with the operational staff, those people who meet the customer face to face. Front-line operational staff is expected to cope with and manage day-to-day environmental work stresses, as well as organisational and role pressure.

The question that comes to mind is why organisations focus more on management development for managers and supervisors and only on job-related skills for operational staff. The following hypotheses will be considered in this study: that a significant relationship exists between sense of coherence, coping, job stress and burnout of engineers, technicians and electricians in a South African electricity distribution organisation.

Over the past 25 years a great deal of research has been devoted to the understanding of prolonged chronic emotional and interpersonal stressors on the job. The use of the term *burnout* for this phenomenon began to appear with some regularity in the 1970s in the United

States, especially among people working in the human services (Maslach, 1982b). However, today it is acknowledged that people in almost any occupation could develop burnout (Dubrin, 1990).

According to Maslach (1978), burnout is the result of repeated emotional pressure related to involvement with people and is characterised by emotional exhaustion, depersonalisation, and detachment from those around you, together with reduced personal accomplishment. Burnout could therefore be viewed as a stress-related illness of those in any profession where constant involvement with people is a critical aspect of their work. Despite extensive research in South Africa on burnout in police officers (Storm, 2002), senior managers in a manufacturing industry (Jansen van Vuuren & Rothmann, 2002), pharmacists and pharmacist's assistants in a corporate pharmacy group (Rothmann, Malan & Rothmann, 2001), burnout in employees working in a technical environment and specifically engineers, technicians and electricians within a South African electricity distribution organisation, has not been studied.

It is certainly clear that the role that engineers, technicians and electricians play within an electricity distribution organisation is of great importance in terms of the quality of supply to customers. These categories of workers are confronted daily with exposure to high voltage electricity and one error of judgement could lead to serious injury or even fatality to the individual or co-workers. Although some of the engineers are not full time field workers, they play a key role in the sourcing of new technology, the design of new sub-stations, and structures and the investigation and monitoring of performance of the plant and networks. Within the electricity distribution industry the sustainability of quality of supply depends on the psychological atmosphere and interpersonal relationships between these specialists and with other support services such as customer services, commercial, capital programme and external consultants and contractors. The addressing of workforce problems such as burnout, which could possibly impact on the quality of customer services or be the cause of occupational injuries, is therefore of great importance (Gupchup, Singhal, Dole & Lively, 1998).

It is often expected of technicians and electricians to attend to call-outs after normal working hours and even over weekends, in order to deal with customer complaints or faulty equipment. Although Maslach and Jackson (1979) describe human service providers as a

population particularly vulnerable to burnout, it is currently acknowledged that people in almost any occupation can develop burnout (Schaufeli & Enzmann, 1998). Burnout is accompanied by feelings of helplessness and hopelessness, disillusionment, negative self-concept, negative attitudes towards work, people and life itself (Maslach & Jackson, 1986).

The consequences of burnout are potentially serious for employees and the customer (both internal and external) with whom they interact. Maslach and Jackson (1986) state that burnout could lead to deterioration in the quality of service that is provided by employees. It also appears to be a factor in job turnover, absenteeism, and low morale. Furthermore, it correlates with various self-reported indices of personal dysfunction, increased use of alcohol and drugs, and marital and family problems (Maslach & Jackson, 1986). Therefore, research regarding the burnout of engineers, technicians and electricians in an electricity distribution organisation is relevant and necessary.

Possible causes of burnout can be classified into personality characteristics, work related attitudes, and work and organisational characteristics (Rothmann, Malan & Rothmann, 2001). Organisational factors, which contribute to burnout are work overload (Corrigan et al., 1994; Landsbergis, 1988), poor collegial support (Golernbiewski & Munzenrider, 1988), role conflict and role ambiguity (Miller, Ellis, Zook & Lyles, 1990) and lack of feedback (participation in decision-making and autonomy). Research on other demographic characteristics that have been found to be related with burnout are age, gender, marital status and level of education (Cash, 1988; Cherniss, 1980; Maslach, Jackson & Leiter, 1996; Schaufeli & Enzmann, 1998). Burnout correlates with young age, gender (with females higher on emotional exhaustion and males higher on depersonalisation, possibly because of gender role-dependent stereotypes), marital status (higher amongst unmarried men), lower educational levels, less work experience and work load (possibly because of reality shock or as an indication of an identity crisis due to unsuccessful occupational socialisation or even a selection or survival bias).

Personality hardiness, a confronting coping style, self-esteem, and extroversion are negatively related to burnout, while an external control orientation, Type A behaviour and neuroticism are positively related to burnout. The tendency to perceive events and circumstances as stressful, ways of coping with them and how failure in coping is dealt with,

depend in part on the dispositional characteristics of a person. These characteristics involve one's beliefs about the world and possibilities of dealing with it (Semmer, 1996), and include constructs such as sense of coherence (Antonovsky, 1987), personality hardiness (Kobasa, 1982) and locus of control (Rotter, 1996).

Antonovsky (1987) suggests that the sense of coherence is a cognitive and emotional appraisal style, which is associated with effective coping, health-enhancing behaviours, and better social adjustment. A strong sense of coherence is also related to general well-being (Feldt, 1997) and emotion stability (Mlonzi & Strumpfer, 1998). In theory, this would mean that individuals with high levels of burnout would be expected to demonstrate weaker levels of sense of coherence. Specifically, the manageability component of sense of coherence has been proven to be related to the emotional exhaustion component of burnout (Rothmann & Malan, 2003).

The relationship between coping and burnout as described by Schaufeli and Enzmann (1998) is a progression of unsuccessful attempts to cope with a variety of negative stress conditions, ultimately resulting in burnout. The process is self-perpetuating, affecting the attainment of professional goals and depleting the resources of the individual to cope with the symptoms and process of burnout. The deciding factor in the coping process is the selection of an appropriate coping strategy, which will determine whether burnout, with all its negative individual and organisational consequences, will develop. Selecting the appropriate coping strategy results in an increase in professional efficacy due to goals, the achievement of goals and consequently the strengthening of coping resources (Schaufeli & Enzmann, 1998).

Folkman and Lazarus (1984) define stress as a disruption of the equilibrium of the cognitive-emotional environmental system by external factors. These external factors, traditionally called stressors, may also lead to an equilibrium of the cognitive and environmental system or a state of well-being, depending on the performance capacities, for example, and the available coping resources within the individual at a given time (Demerouti, Bakker, Nachreiner & Schaufeli, 2001). Stress may be studied in terms of vulnerability to multiple work demands, time pressures and psycho-social conflicts inherent in today's work environments. Job stress can be defined as the harmful physical and emotional responses that occur when the requirements of the job do not match the capabilities, resources or needs of the worker

(Schaufeli & Enzmann, 1998). There is considerable evidence that job stress influences the degree of burnout experienced (Burke, 1997; Greenglass, Burke & Konarski, 1998; Mills & Huebner, 1998). According to Schaufeli and Enzmann (1998) organisational stressors can be divided into two groups, namely job demands and lack of job resources. In this study stress is treated as an independent variable, or as a stimulus that is a possible cause of burnout. Burnout can be considered as a particular kind of prolonged job stress (Brill, 1984), or the result of chronic, ongoing stress.

For the purposes of this research, the focus is on the employee's sense of coherence, coping, job stress and the possible relationship thereof with burnout. It would be of mutual benefit if South African organisations were to invest more in the psychological well-being of its human resources. A major concern in today's organisations is the influence and effect of excessive job stress on the well-being of their employees and the possible decline in productivity. Organisational stressors, job demands and lack of resources has proven to be the key contributor to prolonged job stress. A person's inability to manage and cope comprehensively with the stressors can lead to psychological and emotional exhaustion. If a person continues to use ineffective coping strategies, then increased negativity, and cynical and insensitive attitudes towards work will occur, which will reduce feelings of personal accomplishment. Research regarding the burnout of engineers, technicians and electricians in an electricity supply organisation is therefore relevant and necessary.

The following research questions arise, based on the above-mentioned description of the research problem.

- How are the relationships between burnout, job stress, sense of coherence and coping conceptualised in the literature?
- What are the relationships between burnout, job stress, sense of coherence and coping of engineers, technicians and electricians in a South African electricity distribution organisation?
- Is there a relationship between burnout in job grades?
- Can coping strategies and job stress predict burnout of engineers, technicians and electricians in a South African electricity distribution organisation?

## **1.2 AIM OF THE RESEARCH**

The research aim can be divided into a general aim, with specific objectives.

### **1.2.1 General aim**

The general aim of this research is to establish the relationship between sense of coherence, coping, stress and burnout, and to determine whether coping strategies and job stress can predict the burnout of engineers, technicians and electricians in a South African electricity distribution organisation.

### **1.2.2 Specific aims**

The specific aims of this study are the following:

- to conceptualise burnout, job stress, sense of coherence and coping, as well as the relationship between these constructs from the literature;
- to determine the relationship between burnout, job stress, sense of coherence and coping of engineers, technicians and electricians in a South African electricity distribution organisation;
- to determine the relationship between burnout in job grades and
- to determine whether coping strategies and job stress can predict burnout of engineers, technicians and electricians in a South African electricity distribution organisation.

## **1.3 RESEARCH METHOD**

The research method consists of a literature review and an empirical study. The end results are presented in research article format.

### **1.3.1 Literature review**

The literature review focuses on the relationship between the sense of coherence, coping, job stress and burnout.

### **1.3.2 Empirical study**

#### **1.3.2.1 Research design**

A cross-sectional survey design is used to achieve the research objectives. This design allows for the description of the population at a specific point in time, and is also suited to the development and validation of questionnaires (Shaughnessy & Zechmeister, 1997).

#### **1.3.2.2 Study population**

A stratified, random sample ( $N = 215$ ) is taken of engineers, technicians and electricians from a South African electricity distribution organisation.

#### **1.3.2.3 Measuring battery**

The following measuring instruments are used in the empirical study.

The *Maslach Burnout Inventory - General Survey* (MBI-GS) (Schaufeli et al., 1996) is used to measure burnout. The MBI-GS has three sub-scales: Exhaustion (Ex) (five items, e.g. "I feel used up at the end of the workday"), Cynicism (Cy) (five items, e.g. "I have become less enthusiastic about my work") and Professional Efficacy (PE) (six items, e.g. "In my opinion, I am good at my job"). Internal consistencies (Cronbach alpha coefficients) reported by Schaufeli et al. (1996) varied from 0,87 to 0,89 for Exhaustion, 0,73 to 0,84 for Cynicism and 0,76 to 0,84 for Professional Efficacy. Test-retest reliabilities after one year were 0,65 (Exhaustion), 0,60 (Cynicism) and 0,67 (Professional Efficacy) (Schaufeli et al., 1996). All items are scored on a 7-point frequency rating scale ranging from "0" (never) to "6" (daily).

Storm and Rothmann (2003) confirmed the 3-factor structure of the MBI-GS in a sample of police members, but recommended that Item 13 should be dropped from the questionnaire. The structural equivalence of the MBI-GS for different race groups was also confirmed. The following Cronbach alpha coefficients were obtained for the MBI-GS: Exhaustion: 0,88; Cynicism: 0,79; Professional Efficacy: 0,78 (Storm, 2002).

The *Job Stress Inventory (JSI)* is used to measure the participant's job stress. The Police Stress Inventory (PSI) (Pienaar & Rothmann, 2003) was used as basis to develop a job stress inventory regarding stressors specific to the study population. Each of the 44 items describes a job-related stressor event and assesses both the perceived severity and frequency of occurrence of that event. The JSI is scored on a nine-point frequency and intensity rating scale, varying from 0 ("low") to 9 ("high"). Factor analysis with a varimax rotation of the items identified five underlying factors, namely lack of support, supervision, job demands, transformation and fieldwork. The alpha coefficients of the five scales are 0,89; 0,78; 0,84; 0,83 and 0,75 respectively. All of these values are acceptable ( $\alpha > 0,70$ , Nunnally & Bernstein, 1994), and thus indicate the internal consistency of the factors of the JSI.

The *Orientation to Life Questionnaire (OLQ)* (Antonovsky, 1987) is used to measure the participants' sense of coherence. The OLQ consists of 29 items. Antonovsky (1993) reported Chronbach alpha coefficients of the OLQ in 29 research studies varying between 0,85 and 0,91. Test-retest reliability studies found coefficients between 0,41 and 0,97 (Antonovsky, 1993). Rothmann (2000) reported an alpha coefficient of 0,89 for the OLQ, which may be regarded as acceptable (Nunnally & Bernstein, 1994). In terms of the construct validity of the OLQ, it was found that a negative relationship exists between OLQ and experienced stress and that the OLQ correlates negatively with the "State-Trait Anxiety Inventory-Trait" and the "Beck Depression Inventory" (Frenz, Carey & Jorgenson, 1993).

The *COPE Questionnaire (COPE)* is used to measure participants' coping strategies. The COPE is a multidimensional 53-item coping questionnaire that indicates the different ways that people cope in different circumstances (Carver, Scheier & Weintraub, 1989). Although the original questionnaire measures 13 different coping strategies, Pienaar (2002) subjected the COPE to a principal components factor analysis with a varimax rotation. Three internally consistent factors were extracted, namely *problem-focused coping* (16 items), *passive coping*

(13 items), and *seeking social support* (7 items). The alpha coefficients of the three scales are 0,93, 0,86, and 0,87 respectively. All these values are acceptable ( $\alpha > 0,70$ , Nunnally & Bernstein, 1994), and thus indicate the internal consistency of the factors of the COPE. Test-retest reliability varies from 0,46 to 0,86 and from 0,42 tot 0,89 (applied after two weeks).

#### 1.3.2.4 Statistical analysis

The statistical analysis is carried out with the help of the SAS program (SAS Institute, 2000) and the Amos program (Arbuckle, 1999). The SAS program is used to carry out statistical analysis regarding reliability and validity of measuring instruments, descriptive statistics, t-tests, analysis of variance, correlation coefficients and multiple regression analyses. The Amos program is used to carry out structural equation modelling.

Cronbach alpha coefficients, inter-item correlation coefficients and factor analyses are used to assess the reliability and validity of the measuring instruments (Clark & Watson, 1995). Descriptive statistics (e.g. means, standard deviations, range, skewness and kurtosis) and inferential statistics are used to analyse the data. A cut-off point of  $p = 0,05$  is set for the statistical significance of the results. Effect sizes (Cohen, 1988) are used to decide on the practical significance of the findings. Pearson product-moment correlation coefficients are used to specify the relationship between the different variables. A cut-off point of 0,30 (medium effect) (Cohen, 1988) is set for the practical significance of correlation coefficients. T-tests and analyses of variance are used to determine the differences between groups. A stepwise multiple regression analysis will be conducted to determine the percentage of variance in the dependent variables (burnout) that is predicted by the independent variables.

Canonical correlation are used to determine the relationships between the dimensions of burnout, job stress, sense of coherence and coping strategies. The goal of canonical correlation is to analyse the relationship between two sets of variables (Tabachnick & Fidell, 2001). Canonical correlation is considered a descriptive technique rather than a hypothesis-testing procedure.

Structural equation modelling is used to construct a causal model of burnout. Structural equation modelling is a statistical methodology that takes a confirmatory (i.e. hypothesis-testing) approach to the analysis of a structural theory bearing on some phenomenon (Byrne,

2001). The term “structural equation modelling” (SEM) conveys two important aspects of the procedure:

- \* that the causal processes in the study are represented by a series of structural (i.e. regression) equations, and
- \* that these structural relations can be modelled pictorially to enable a clear conceptualisation of the theory in the study.

Several aspects of SEM differentiate it from the previous generation of multivariate procedures (Byrne, 2001). Firstly, it adopts a confirmatory rather than an exploratory approach to data-analysis. Furthermore, by demanding that the pattern of inter-variable relations be specified *a priori*, SEM lends itself well to the analysis of data for inferential purposes. Secondly, although traditional multivariate procedures are incapable of either assessing or correcting for error in measurement, SEM provides explicit estimates of these error variance parameters. Thirdly, SEM procedures can both unobserved (latent) and observed variables.

#### **1.4 RESEARCH PROCEDURE**

The measuring battery will be compiled, with a letter explaining the purpose of the research as well as a brief explanation regarding the completing of the questionnaires. Ethical aspects regarding the research will be discussed with the participants. The battery will be administered in small groups at the different work places on suitable dates.

#### **1.5 DIVISION OF CHAPTERS**

Chapter 1: Introduction

Chapter 2: Research article

Chapter 3: Conclusions, limitations and recommendations

## **1.6 CHAPTER SUMMARY**

In this chapter the problem statement, the aims of the study, research method and research procedure were discussed. A prospective chapter division was also indicated.

Chapter 2 contains the research article.

# SENSE OF COHERENCE, COPING AND BURNOUT IN AN ELECTRICITY SUPPLY ORGANISATION\*

L. J. STEYN  
S. ROTHMANN  
K. MOSTERT

*WorkWell: Research Unit for People, Policy and Performance, Faculty of Economic and  
Management Sciences, PU for CHE*

## ABSTRACT

The objective of this study was to determine the relationship between sense of coherence, coping, job stress and burnout of engineers, technicians and electricians in an electricity supply organisation. A cross-sectional survey design was used. The study population consisted of 38 engineers, 86 technicians and 91 electricians. The Maslach Burnout Inventory - General Survey, a Job Stress Questionnaire, the Orientation to Life Questionnaire and the COPE were administered. The results showed that stress because of job demands, lack of support, supervision and transformation, as well as a weak sense of coherence predicted exhaustion. Exhaustion and avoidance predicted cynicism. A causal sequence was found between sense of coherence, job stress and exhaustion. Active coping moderated the effect of sense of coherence on professional efficacy.

## OPSOMMING

Die doel van hierdie studie was om die verband tussen koherensiesin, coping, werkstres en uitbranding tussen ingenieurs, tegniese en elektrisies in 'n elektrisiteitsverspreidingsorganisasie vas te stel. 'n Dwarsdeursnee opname-ontwerp is gebruik. Die steekproef het bestaan uit 38 ingenieurs, 86 tegniese en 91 elektrisies. Die Maslach Uitbrandingsvraelys - Algemene Opname, 'n Werkstresvraelys, die Lewensorientasievraelys en die COPE is as meetinstrumente gebruik. Die resultate het getoon dat stres a.g.v. werkseise, gebrek aan ondersteuning, toesighouding en transformasie, asook 'n swak koherensiesin uitputting voorspel. Uitputting en vermyding het sinisme voorspel. 'n Oorsaaklike gevolg tussen koherensiesin, werkstres en uitputting was gevind. Aktiewe coping het die effekte van koherensiesin op professionele bekwaamheid gemodereer.

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Modern business is highly competitive, demanding and expensive. Organisations, management and employees are under constant pressure to achieve higher targets. Solutions are expected to be quicker, smarter and cheaper – regardless of the cost (Brunt, 2000). Organisations everywhere are downsizing, outsourcing and restructuring, leaving workers at all levels feeling stressed, insecure, misunderstood, undervalued and alienated. With fewer staff doing more work in nearly every industry, employees are feeling the drain both mentally and physically (Wise, 2001). Moreover, skilled workers for newly developed positions are more difficult than ever to find, causing added workloads for current employees.

The cost of burned out employees is high, for both employees and organisations, because burned-out employees do the bare minimum instead of their best (Maslach, 2001). According to Boshoff and Arnolds (1995), most employers agree that the effectiveness and success of their organisations depends on the utilisation of their human resources. Employees' levels of wellness (and specifically the absence of burnout) are one indicator of the effectiveness of an organisation (Kreitner & Kinicki, 1998).

With the transformation to a democracy in South Africa in 1994 the basic need for electricity for all became evident. This need together with other macro and micro environmental influences such as government legislation, new technology and changes within the electricity distribution industry, has placed tremendous pressure on providing affordable energy and related services in order to continually improve performance and enhance development. This pressure causes stress in the workplace, which could eventually lead to burnout and ill-health (Wise, 2001). It is therefore necessary to investigate, examine and understand those factors that contribute to and ensure wellness at work for continuous effectiveness and growth.

Although extensive research has been carried out in South Africa on burnout in police officers (Storm, 2002), senior managers in a manufacturing industry (Jansen van Vuuren & Rothmann, 2002), pharmacists and pharmacist's assistants in a corporate pharmacy group (Rothmann, Malan & Rothmann, 2001), burnout of employees working in a technical/engineering environment in South Africa has not yet been investigated. In line with recent research regarding the role of police officers and many other non-technical workers, the role of engineers, technicians and electricians within an electricity distribution organisation is of great significance in terms of the quality and reliability of supply to

customers. These categories of workers are confronted with daily exposure to high voltage electricity and one error of judgement could lead to serious injury or even fatality to the individual or co-workers. Although some of the engineers are not full time field workers, they play a key role in the sourcing of new technology, the design of new sub-stations and structures, the investigation and monitoring the performance of the plant and networks.

Within the electricity distribution industry the sustainability of quality of supply depends on the psychological atmosphere and interpersonal relationships between these specialists and with other support services such as customer services, commercial, capital programme and external consultants/contractors. The addressing of workforce problems, such as burnout, which could possibly impact on the quality of customer services or be the cause of occupational injuries, is therefore of great importance (Gupchup, Singhal, Dole & Lively, 1998). In many cases, it is expected that technicians and electricians be called-out after normal working hours and even over weekends to attend to customer complaints or faulty equipment.

The objective of this study was to determine the relationship between burnout, occupational stress, sense of coherence and coping strategies of engineers, technicians and electricians within a South African electricity distribution organisation.

### **Burnout, stress, sense of coherence and coping**

Burnout is a metaphor that is commonly used to describe a state or process of mental exhaustion (Schaufeli & Enzmann, 1998). The concept of burnout was popularised by Freudenberger (1989) within psychoanalysis, and by Maslach (1982a; 1982b) and Pines (Pines, Aronson & Kafry, 1981) from a social psychology and empirical framework (Farber, 1983). According to Schaufeli and Enzmann (1998), burnout can be defined as a persistent, negative, work-related state of mind (or syndrome) developing over time in so-called “normal” individuals, characterised by an array of physical, psychological and attitudinal symptoms, primarily exhaustion, and accompanied by distress, a sense of reduced effectiveness, decreased motivation and the development of dysfunctional personal and societal attitudes and behaviours at work. This psychological condition develops gradually but may remain unnoticed for a long time by the individual involved.

Stress in itself is not to be confused with burnout (Maslach, 1982a; Pines et al., 1981; Schaufeli & Enzmann, 1998). Burnout can be seen as a particular type of prolonged job stress, the final step in a progression of unsuccessful attempts to cope with a variety of negative stress conditions. Burnout also differs from depression (Maslach & Jackson, 1984), which refers to the individual's symptoms across all life situations, and is regarded as job related (Cilliers, 2002). Burnout is a process initiated by extremely intensive and long-term stress and tension in the working environment (Schaufeli & Buunk, 1992).

Burnout is a syndrome that consists of three essential dimensions (Maslach, 1982a). According to Schaufeli et al. (1996), burnout incorporates the following three dimensions:

- **Exhaustion:** this refers to the depletion or draining of emotional resources and feelings of being overextended. It is accompanied by distress, a sense of reduced effectiveness, decreased motivation, and the development of dysfunctional attitudes and behaviours at work.
- **Cynicism:** this refers to interpersonal dimensions of burnout and results in a negative, callous or excessively detached response to various aspects of the job.
- **Professional Efficacy:** this refers to the self-evaluation dimension of burnout and is a feeling of competence, productivity and achievement at work.

The consequences of burnout are potentially serious for employees and the customer (internal and external) with whom they interact. Maslach and Jackson (1986) state that burnout could lead to deterioration in the quality of service that is provided by employees. It appears to be a factor in job turnover, absenteeism, and low morale. Furthermore, it correlates with various self-reported indices of personal dysfunction, increased use of alcohol and drugs, and marital and family problems (Maslach & Jackson, 1986).

Organisational factors that contribute to burnout are stress because of work overload (Corrigan et al., 1994; Landsbergis, 1988), poor collegial support (Golembiewski & Munzenrider, 1988), role conflict and role ambiguity (Miller, Ellis, Zook & Lyles, 1990) and lack of feedback (participation in decision-making and autonomy). According to Schaufeli

and Enzmann (1998), work related attitudes and high (unrealistic) expectations are also related to burnout.

In 1979, the medical sociologist, Aaron Antonovsky wrote that despite being bombarded by multiple stressors in everyday living and undergoing severe traumatic experiences, there are individuals who are coping quite well and staying healthy. Salutogenesis is a concept created by Antonovsky (1979) to emphasise the focus of his model on health rather than on disease (i.e., pathogenesis) (Heim, 1994). Sense of coherence was introduced as a key concept of salutogenesis (Antonovsky, 1979). Sense of coherence is defined as “a global orientation that expresses the extent to which one has a pervasive, enduring though dynamic feeling of confidence that one’s internal and external environments are predictable and that there is a high probability that things will work out as well as can reasonably be expected” (Antonovsky, 1979).

Much subsequent work has confirmed that a person’s SOC is an important component for one’s health and well being (Antonovsky, 1987, 1993; Bengtsson-Tops & Hansson, 2001; Strang & Strang, 2001). Each person’s sense of coherence, or sense of well-being, requires certain inherent prerequisites for coping successfully, which are represented by the concepts; comprehensibility, manageability and meaningfulness (Antonovsky, 1987).

- **Comprehensibility:** refers to the extent to which a person finds or structures their world to be understandable, meaningful, orderly and consistent instead of chaotic, random and unpredictable. The person perceived their world as comprehensible and making sense on a cognitive level.
- **Manageability:** refers to the extent to which people experience events in life as situations that are endurable or manageable and can even be seen as new challenges. Individuals feel they have the resources to meet the demands, or feel that they know where to go to get help.
- **Meaningfulness:** refers to the extent to which one feels that life makes sense on an emotional and not just on a cognitive level, and that life’s demands are worthy of commitment. It is, essentially, seeing coping as desirable.

To optimise the chances of successful coping with a stressor, one must believe (1) that one understands the problem; (2) that one has at one's disposal the resources which are needed; and (3) one must wish to cope with the problem. The health of a person depends on their ability to cope, as well as on the supports or resources they can turn to for help. The resources a person draws on in times of need act as "buffering, ameliorating or mediating mechanisms, thought of as blunting the invariably negative impact of stressors and thus preventing breakdown" (Antonovsky, 1993). These resources can be internal such as self-esteem and the cognitive ability to learn to cope, with feelings of inferiority; for example, or they can be external, such as the local environment and cultural influences. These internal and external resources are sometimes interchangeable and a person accumulates them through life experiences from childhood onwards. The stronger the sense of coherence a person has the better ability they have to employ cognitive, affective and instrumental strategies which are likely to improve coping and thus well-being.

According to Antonovsky (1987), it is essential to understand that a strong SOC is not a particular coping style, and that the stressors life poses are many and varied. To adopt one pattern of coping consistently is precisely to fail to respond to the nature of the stressor and hence to decrease the chances of successful coping. What the person with a strong SOC does is to select the particular coping strategy that seems most appropriate to deal with the stressor being confronted. The availability of a wide repertoire of coping strategies, then, and flexibility in choice at any give time, is crucial. (Antonovsky, 1987; Feldt, 1997).

A strong sense of coherence is also related to general well-being (Feldt, 1997) and emotional stability (Mlonzi & Strumpfer, 1998). In theory, this would mean that individuals with high levels of burnout would be expected to demonstrate weaker levels of sense of coherence. Specifically, the manageability component of sense of coherence has been proven to be related to the exhaustion component of burnout (Rothmann & Malan, 2003).

Although sense of coherence has been defined as a relatively stable dispositional orientation (Antonovsky, 1987), it is possible that job stress could impact on employee's sense of coherence. However, a strong sense of coherence might help employees to understand stressors, and to regard them as manageable and meaningful. Therefore, a sense of coherence might moderate the effects of job stressors on exhaustion. Also, sense of coherence is

expected to contribute to professional efficacy of employees (Rothmann, Jackson & Kruger, 2003).

Decades of research on cognitive and behavioural therapy have left no doubt that one's appraisal of a situation plays a key role in one's well being (Beck, 1993, 1997; Clark, 1999; Wells-Federman, Sturt-Shor & Webster, 2001). Everyone appraises situations in their own distinct way, and those appraisals are decisive for whether or not a particular situation is stressful. A pathogenic appraisal can start a vicious circle of stress, whereas a salutogenic appraisal can relieve counterproductive emotions and provide opportunities for coping suitably with the situation.

Kleinke (1991) describes coping as "the efforts we make to manage situations we have appraised as potentially harmful or stressful". Coping refers to perceptual, cognitive or behavioural responses that are used to manage, avoid or control situations that could be regarded as difficult (Folkman & Lazarus, 1984; Moos, 1994; Zeider & Endler, 1996). The term "coping" could be used to refer to either strategies or results (Fleishmann, 1984). As a strategy, coping refers to the different methods that an individual may apply to manage his or her circumstances. As a result, coping refers to the eventual outcomes of this strategy for the individual. For the purpose of this research, the focus is on coping as a strategy. Lazarus and his colleagues noted that a person's ability to withstand potentially stressful situations depends strongly on how the person views such situations (Folkman & Lazarus, 1984).

Non-coping can be understood as failed efforts to cope, accompanied by various physical and psycho-social disturbances, which result in greater stress (Callen, 1993). Non-copers experience that things do not make sense and they lose perspective on issues. Non-coping results in higher levels of depression and anxiety (Carver, Scheier & Weintraub, 1989). Research indicates that these elements are negatively related to sense of coherence (Mlonzi & Strümpfer, 1998).

Amirkhan (1994), Callen (1993) and Folkman and Lazarus (1984) identify two elements of coping strategies, namely problem-focused and emotion-focused. Problem-focused coping is directed at eliminating an unpleasant experience or reducing the effects thereof. Emotion-focused coping is directed at reducing the effects of stressful feelings caused by an unpleasant

experience through relaxation, the use of alcohol and drugs, social activities and/or defence mechanisms. Some variations of problem-focused coping are active coping, planning, suppressing competing activities, restraint coping and seeking social support for instrumental reasons (looking for advice, support or information). Furthermore, variations of emotional-focused coping are seeking social support for emotional reasons, positive reinterpretations, denial, acceptance and turning to religion. Focus on and venting of emotions, behavioural disengagement, mental disengagement and alcohol-drug disengagement are less used coping strategies (Carver et al., 1989).

The relationship between coping and burnout as described by Schaufeli and Enzmann (1998) is a progression of unsuccessful attempts to cope with a variety of negative stress conditions, ultimately resulting in burnout. The process is self-perpetuating, affecting the attainment of professional goals and depleting the resources of the individual to cope with the symptoms and process of burnout (Schaufeli & Enzmann, 1998). The deciding factor in the coping process is the selection of an appropriate coping strategy, which will determine whether burnout, with all its negative individual and organisational consequences, will develop. Selecting the appropriate coping strategy results in an increase in professional efficacy due to goals, the achievement of goals and consequently the strengthening of coping resources (Schaufeli & Enzmann, 1998). Alsoofi, Al-Heeti and Alwashli (2000) found a significant correlation between ways of coping and burnout.

The above discussion leads to the following hypotheses: A significant relationship exists between sense of coherence, coping, job stress and burnout of engineers, technicians and electricians in a South African electricity distribution organisation.

## **METHOD**

### **Research design**

A cross-sectional survey design was used to reach the research objectives. This design allows for the description of the population at a specific point in time, and is suited to the development and validation of questionnaires (Shaughnessy & Zechmeister, 1997).

## **Study population**

Random samples ( $N = 215$ ) were taken from engineers, technicians and electricians from a South African electricity distribution organisation. Table 1 presents some of the characteristics of the participants.

Table 1

*Characteristics of the Participants*

Item	Category	Percentage
Division	Field Services	72,09
	Electricity Delivery	8,84
	Network Services	19,07
Designation	Engineer	17,59
	Technician	39,81
	Electrician	42,13
Job Grade	BBU	6,02
	CCL	36,11
	CCU	48,61
	PA0	2,78
	PPP/MMM	6,48
Post Description	Manager/ Supervisor	33,33
	Non- Manager/ Supervisor	66,67
Years of Service	< 2 years	6,02
	2-5 years	11,57
	6-10 years	19,44
	> 10 years	62,96
Years in Job	< 2 years	16,36
	2-5 years	28,50
	6-10 years	26,17
	11-20 years	27,10
	21-30 years	1,87
Gender	Male	98,14
	Female	1,86
Age	20-30 years	16,67
	31-40 years	38,43
	41-50 years	37,50
	51-65 years	7,41
Education	Grade 10-11	15,02
	Grade 12	8,92
	Grade 12 +1, 2 or 3 years post grade 12	36,15
	> Three years post grade 12	39,91

The participants were predominantly male (98,14%), married, and had an education of more than one year post grade 12. The categories of participants were mostly technicians (39,81%) and electricians (42,13%) within the non-managerial/supervisory function. The mean age of participants was 40,50 years. The majority of participant's length of service was more than 10

years (62,96%) and 67,13% of them do standby duties.

### **Measuring battery**

The following measuring instruments were used in the empirical study.

The *Maslach Burnout Inventory - General Survey* (MBI-GS) (Schaufeli et al., 1996) was used to measure burnout. The MBI-GS has three sub-scales: Exhaustion (Ex) (five items, e.g. “I feel used up at the end of the workday”), Cynicism (Cy) (five items, e.g. “I have become less enthusiastic about my work”) and Professional Efficacy (PE) (six items, e.g. “In my opinion, I am good at my job”). Internal consistencies (Cronbach coefficient alphas) reported by Schaufeli et al. (1996) varied from 0,87 to 0,89 for Exhaustion, 0,73 to 0,84 for Cynicism and 0,76 to 0,84 for Professional Efficacy. Test-retest reliabilities after one year were 0,65 (Exhaustion), 0,60 (Cynicism) and 0,67 (Professional Efficacy) (Schaufeli et al., 1996). All items are scored on a 7-point frequency rating scale ranging from “0” (never) to “6” (daily). Storm and Rothmann (2003) confirmed the 3-factor structure of the MBI-GS in a sample of police members, recommending that Item 13 should be dropped from the questionnaire. The structural equivalence of the MBI-GS for different race groups was also confirmed. The following Cronbach alpha coefficients were obtained for the MBI-GS: Exhaustion: 0,88; Cynicism: 0,79; Professional Efficacy: 0,78 (Storm, 2002).

The *Job Stress Inventory (JSI)* was used to measure the participant’s job stress. The Police Stress Inventory (PSI) (Pienaar & Rothmann, 2003) was used as basis to develop a job stress inventory regarding stressors specific to the study population. Each of the 44 items describes a job-related stressor event and assesses both the perceived severity and frequency of occurrence of that event. The JSI is scored on a nine-point frequency and intensity rating scale, varying from 0 (“low”) to 9 (“high”). Factor analysis with a varimax rotation of the items identified five underlying factors, namely lack of support, supervision, job demands, transformation and fieldwork. The alpha coefficients of the five scales are 0,89; 0,78; 0,84; 0,83 and 0,75 respectively. All these values are acceptable ( $\alpha > 0,70$ , Nunnally & Bernstein, 1994), and thus indicate the internal consistency of the factors of the JSI.

The *Orientation to Life Questionnaire* (OLQ) (Antonovsky, 1987) was used to measure the participants' sense of coherence. The OLQ consists of 29 items. Antonovsky (1993) reported Chronbach alpha coefficients of the OLQ in 29 research studies varying between 0,85 and 0,91. Test-retest reliability studies found coefficients between 0,41 and 0,97 (Antonovsky, 1993). Rothmann (2000) reported an alpha coefficient of 0,89 for the OLQ, which may be regarded as acceptable (Nunnally & Bernstein, 1994). In terms of the construct validity of the OLQ, it was found that a negative relationship exists between OLQ and experienced stress and that the OLQ correlates negatively with the "State-Trait Anxiety Inventory-Trait" and the "Beck Depression Inventory" (Frenz, Carey & Jorgenson, 1993).

The *COPE Questionnaire* (COPE) was used to measure participants' coping strategies. The COPE is a multidimensional 53-item coping questionnaire that indicates the different ways that people cope in different circumstances (Carver et al., 1989). Although the original questionnaire measures 13 different coping strategies, Pienaar (2002) subjected the COPE to a principal components factor analysis with a varimax rotation. Three internally consistent factors were extracted, namely *problem-focused coping* (16 items), *passive coping* (13 items), and *seeking social support* (7 items). The alpha coefficients of the three scales are 0,93, 0,86, and 0,87 respectively. All these values are acceptable ( $\alpha > 0,70$ , Nunnally & Bernstein, 1994), and thus indicate the internal consistency of the factors of the COPE. Test-retest reliability varies from 0,46 to 0,86 and from 0,42 tot 0,89 (applied after two weeks).

### **Statistical analysis**

The statistical analysis was carried out with the help of the SAS program (SAS Institute, 2000) and the Amos program (Arbuckle, 1999). Cronbach alpha coefficients, inter-item correlation coefficients and factor analysis were used to assess the reliability and validity of the measuring instruments (Clark & Watson, 1995). Descriptive statistics (e.g. means, standard deviations, range, skewness and kurtosis) and inferential statistics were used to analyse the data. A cut-off point of  $p = 0,05$  was set for the statistical significance of the results. Effect sizes (Cohen, 1988) were used to decide on the practical significance of the findings. Pearson product-moment correlation coefficients were used to specify the relationship between the different variables.

A cut-off point of 0,30 (medium effect) (Cohen,1988) was set for the practical significance of correlation coefficients.

Multivariate analysis of variance (MANOVA) was used to determine the significance of differences between the burnout (exhaustion, cynicism and professional efficacy) of demographic groups. MANOVA tests whether mean differences among groups on a combination of dependent variables are likely to have occurred by chance (Tabachnick & Fidell, 2001). In MANOVA a new dependent variable that maximises group differences is created from the set of dependent variables. One-way analysis is then performed on the newly created dependent variable. Wilk's lambda was used to test the significance of the effects. Wilk's Lambda is a likelihood ratio statistic that tests the likelihood of the data under the assumption of equal population mean vectors for all groups against the likelihood under the assumption that the population mean vectors are identical to those of the sample mean vectors for the different groups. When an effect was significant in MANOVA, ANOVA was used to discover which dependent variables were affected. Because multiple ANOVAs were used, a Bonferroni type adjustment was made for inflated Type 1 error. Tukey tests were done to indicate which groups differed significantly when ANOVAs were done.

Effect sizes (Cohen, 1988; Steyn, 1999) were used in addition to statistical significance to determine the significance of relationships. Effect sizes indicate whether obtained results are important (while statistical significance may often show results which are of little practical relevance). The use of only statistical significance testing in a routine manner has been criticised and from the editors of some periodicals there have been appeals to place more emphasis on effect sizes (Steyn, 1999).

The following formula was used to determine the practical significance of means of more than two groups (Steyn, 1999):

$$d = \frac{Mean_a - Mean_b}{\text{Root } MSE}$$

Where

$Mean_1$  = Mean of first group

$Mean_2$  = Mean of the second group

Root MSE = Root Mean Square Error

A cut-off point of 0,50 (medium effect) (Cohen, 1988) was set for the practical significance of differences between means.

Structural equation modelling was used to construct a causal model of burnout. Hypothesised relationships are tested empirically for goodness-of-fit with the sample data. The  $\chi^2$  statistic and several other goodness-of-fit indexes summarise the degree of correspondence between the implied and observed covariance matrixes. Jöreskog and Sörborn (1993) suggest that the  $\chi^2$  value may be considered more appropriately as a badness-of-fit, rather than as a goodness-of-fit measure in the sense that a small  $\chi^2$  value is indicative of good fit. However, because the  $\chi^2$  statistic equals  $(N - 1)F_{\min}$ , this value tends to be substantial when the model does not hold and the sample size is large (Byrne, 2001). Researchers have addressed the  $\chi^2$  limitations by developing goodness-of-fit indexes that take a more pragmatic approach to the evaluation process. For instance a  $\chi^2$ /degrees of freedom ratio ( $\chi^2/df$ ) value  $< 2$  indicates acceptable fit (Tabachnick & Fidell, 2001).

The Goodness-of-Fit Index (GFI) indicates the relative amount of the variances/co-variances in the sample predicted by the estimates of the population. It usually varies between 0 and 1, and a result of 0,90 or above indicates a good model fit. In addition, the Adjusted Goodness-of-Fit Index (AGFI) is given. The AGFI is a measure of the relative amount of variance accounted for by the model, corrected for the degrees of freedom in the model relative to the number of variables. The GFI and AGFI can be classified as absolute indexes of fit because they basically compare the hypothesised model with no model at all (Hu & Bentler, 1995). Although both indexes range from zero to 1,00, the distribution of the AGFI is unknown, therefore no statistical test or critical value is available (Jöreskog & Sörborn, 1986). The parsimony goodness-of-fit index (PGFI) addresses the issue of parsimony in SEM (Mulaik et al., 1989). The PGFI takes into account the complexity (i.e., number of estimated parameters) of the hypothesised model in the assessment of overall model fit and provides a more realistic

evaluation of the hypothesised model. Mulaik et al. (1989) suggest that indexes in the 0,90's accompanied by PGFIs in the 0,50s are not unexpected. (Byrne, 2001).

The Normed Fit Index (NFI) is used to assess global model fit. The NFI represents the point at which the model being evaluated falls on a scale running from a null model to perfect fit. This index is normed to fall on a 0 to 1 continuum. Marsh, Balla and Hau (1996) suggest that this index is relatively insensitive to sample sizes. The Comparative Fit Index (CFI) represents the class of incremental fit indexes in that it is derived from the comparison of a restricted model (i.e., one in which structure is imposed on the data) with that of an independence (or null) model (i.e., one in which all correlations among variables are zero) in the determination of goodness-of-fit. The Tucker-Lewis Index (TLI) (Tucker & Lewis, 1973), is a relative measure of co-variation explained by the model that is specifically developed to assess factor models. For these fit indexes (NFI, CFI and TLI), it is more or less generally accepted that a value of less than 0,90 indicates that the fit of the model could be improved (Hoyle, 1995), although a revised cut-off value close to 0,95 has recently been advised (Hu & Bentler, 1999).

To overcome the problem of sample size, Browne and Cudeck (1993) suggest using the Root Mean Square Error of Approximation (RMSEA) and the 90% confidence interval of the RMSEA. The RMSEA estimates the overall amount of error; it is a function of the fitting function value relative to the degrees of freedom. The RMSEA point estimate should be 0,05 or less and the upper limit of the confidence interval should not exceed 0,08. Hu and Bentler (1999) propose a value of 0,06 to be indicative of good fit between the hypothesised model and the observed data. MacCallum, Browne, and Sugawara (1996) recently elaborated on these cut-off points and noted that RMSEA values ranging from 0,08 to 0,10 indicate mediocre fit, and those greater than 0,10 indicate poor fit.

## **RESULTS**

Table 2 shows the descriptive statistics, the Cronbach alpha coefficients and the mean inter-item correlation coefficients of the MBI-GS, JSI, OLQ and COPE.

Table 2

*Descriptive Statistics, Alpha Coefficients and Inter-Item Correlations of the MBI-GS, JSI, OLQ and COPE*

Item	Mean	SD	Skewness	Kurtosis	$r(\text{Mean})$	$\alpha$
<b>MBI-GS (Burnout)</b>						
EE	12,05	7,50	0,56	-0,45	0,64	0,90
CY	8,33	5,65	0,62	-0,24	0,43	0,75
PE	28,12	6,96	-1,20	1,20	0,40	0,80
<b>JSI (Job Stress)</b>						
Lack of Support	59,07	19,84	-0,37	-0,60	0,43	0,89
Supervision	24,31	9,89	0,13	-0,87	0,37	0,78
Job Demands	26,09	11,19	0,23	-0,44	0,47	0,84
Transformation	39,99	12,46	-0,46	-0,26	0,41	0,83
Fieldwork	17,31	8,11	0,22	-0,78	0,43	0,75
<b>OLQ</b>						
Tot OLQ	135,07	20,72	-0,34	0,97	0,18	0,86
<b>COPE</b>						
Active Coping	53,85	9,90	-0,74	0,53	0,35	0,90
Seeking Emotional Support	20,57	5,62	-0,22	-0,60	0,45	0,87
Avoidance	15,29	4,48	0,31	-0,57	0,27	0,75
Turning to Religion	12,42	3,12	-0,98	0,32	0,56	0,84

The scores on the MBI-GS, JSI, OLQ and COPE are distributed in a normal fashion, with low skewness and kurtosis. It is only Professional Efficacy that showed relatively higher skewness and kurtosis. The Cronbach alpha coefficients of all measuring instruments are considered to be acceptable compared to the guideline of  $\alpha > 0,70$  (Nunnally & Bernstein, 1994). Furthermore, with few exceptions, the inter-item correlations are considered acceptable compared to the guideline of  $0,15 \leq r \leq 0,50$  (Clark & Watson, 1995).

The product-moment correlation coefficients between the MBI-GS, JSI, OLQ and COPE are reported in Table 3.

Table 3

*Product-Moment Correlation Coefficients between the MBI-GS, JSI, OLQ and COPE*

Item	1	2	3	4	5	6	7	8	9	10	11	12
1. Exhaustion	-	-	-	-	-	-	-	-	-	-	-	-
2. Cynicism	0,61 <sup>+++</sup>	-	-	-	-	-	-	-	-	-	-	-
3. Professional Efficacy	-0,05	-0,18 <sup>*</sup>	-	-	-	-	-	-	-	-	-	-
4. Lack of Support	0,42 <sup>++</sup>	0,43 <sup>++</sup>	0,02	-	-	-	-	-	-	-	-	-
5. Supervision	0,28 <sup>*</sup>	0,30 <sup>++</sup>	-0,03	0,55 <sup>+++</sup>	-	-	-	-	-	-	-	-
6. Job Demands	0,35 <sup>++</sup>	0,38 <sup>++</sup>	-0,13	0,61 <sup>+++</sup>	0,54 <sup>+++</sup>	-	-	-	-	-	-	-
7. Transformation	0,36 <sup>++</sup>	0,41 <sup>++</sup>	0,11	0,67 <sup>+++</sup>	0,51 <sup>+++</sup>	0,50 <sup>+++</sup>	-	-	-	-	-	-
8. Fieldwork	0,18 <sup>*</sup>	0,25 <sup>*</sup>	-0,00	0,55 <sup>+++</sup>	0,51 <sup>+++</sup>	0,47 <sup>++</sup>	0,46 <sup>++</sup>	-	-	-	-	-
9. Total OLQ	-0,31 <sup>++</sup>	-0,43 <sup>++</sup>	0,23 <sup>*</sup>	-0,32 <sup>++</sup>	-0,30 <sup>++</sup>	-0,41 <sup>++</sup>	-0,37 <sup>++</sup>	-0,35 <sup>++</sup>	-	-	-	-
10. Active Coping	-0,09	0,15 <sup>*</sup>	0,47 <sup>++</sup>	0,12 <sup>*</sup>	0,03	0,01	0,15 <sup>*</sup>	0,13 <sup>*</sup>	0,23 <sup>*</sup>	-	-	-
11. Seeking Emotional Support	0,08	0,08	0,14 <sup>*</sup>	0,11	0,02	0,14 <sup>*</sup>	0,14 <sup>*</sup>	0,26 <sup>*</sup>	0,00	0,46 <sup>++</sup>	-	-
12. Avoidance	0,15 <sup>*</sup>	0,33 <sup>++</sup>	-0,17 <sup>*</sup>	0,16 <sup>*</sup>	0,17 <sup>*</sup>	0,23 <sup>*</sup>	0,16 <sup>*</sup>	0,31 <sup>++</sup>	-0,47 <sup>++</sup>	-0,00	0,21 <sup>*</sup>	-
13. Turning to Religion	0,03	0,10	0,04	0,17 <sup>*</sup>	0,14 <sup>*</sup>	0,15 <sup>*</sup>	0,21 <sup>*</sup>	0,20 <sup>*</sup>	0,10	0,37 <sup>++</sup>	0,27 <sup>*</sup>	0,26 <sup>*</sup>

\* Statistically significant difference:  $p < 0.01$

+ Correlation is practically significant  $r > 0,30$  (medium effect)

++ Correlation is practically significant  $r > 0,50$  (large effect)

As can be seen in Table 3, Sense of coherence is negatively related to Lack of Support, Supervision, Transformation, Fieldwork and Avoidance Coping (practically significant, medium effect). Sense of Coherence is also negatively related to Exhaustion and Cynicism (practically significant, medium effect). Lack of Support, Job Demands and Transformation are practically significantly related to Exhaustion and Cynicism (medium effect) and Supervision to Cynicism (medium effect). It seems that Fieldwork is practically significantly related to Avoidance (medium effect). Active Coping is practically significantly related to Professional Efficacy (medium effect). Avoidance Coping is practically significantly related to Cynicism (medium effect). Exhaustion is positively related to Cynicism (large effect).

Next, MANOVA and ANOVA analyses followed to determine the relationship between burnout and various demographic characteristics. Demographic characteristics were first analysed for statistical significance using Wilk's Lambada statistics. The results of these comparisons are reflected in Table 4.

Table 4

*MANOVA of Differences between Burnout of Demographic Groups*

	Value	F	df	Den DF	p
Occupation	0,93	2,68	6	420,00	0,01*
Division	0,94	2,14	6	418,00	0,05
Job grade	0,87	2,49	12	550,61	0,00*

\* Statistically significant difference:  $p < 0.01$

In an analysis of Wilk's Lambada values, no difference could be found between burnout of different divisions (field services, network services and electricity delivery). Statistically significant differences were found between burnout of different occupational groups ( $p < 0.01$ ). The relationship between burnout and occupation as well as job grade was further analysed to determine practical significant using ANOVA, followed by Tukey HSD tests, and the results are given in Tables 5 and 6.

The differences between the burnout of employees in different occupations (engineers, technicians and electricians) are reported in Table 5.

Table 5

*Mean Differences between Burnout of Engineers, Technicians and Electricians*

Item	Engineers	Technicians	Electricians	Root MSE	p
Exhaustion	12,05	11,27	12,88	-	0,36
Cynicism	6,90	7,88	9,45	5,57	0,04*
Professional Efficacy	27,61	29,72	26,79	6,88	0,01*

\* Statistically significant difference:  $p < 0.01$

Table 5 demonstrates that statistically significant difference exists between the professional efficacy of engineers, technicians and electricians. However, the difference was not practically significant.

The differences between the burnout of employee's in different job grades are reported in Table 6.

Table 6  
*Mean Differences between Burnout in Job Grades*

Item	BBU	CCL	CCU	PAO	PPP/MMM	Root MSE	<i>p</i>
Exhaustion	11,15	12,22	12,48	6,80	11,21	-	0,53
Cynicism	10,54 <sup>a</sup>	9,36	7,92	5,80	5,14 <sup>c</sup>	5,55	0,03 <sup>*</sup>
Efficacy	22,39 <sup>c</sup>	27,51	29,13	25,60	29,93 <sup>a</sup>	6,82	0,01 <sup>*</sup>

\* Statistically significant difference:  $p < 0.01$

a Practically significant difference from area (in row) where b (medium effect,  $d \geq 0,5$ ) or c (large effect,  $d \geq 0,8$ ) are indicated

Table 6 shows that a statistically and practically significant difference (large effect) exists between Paterson job grade BBU (semi-skilled to skilled category) and Paterson job grade PPP/MMM (professional and managerial category). This result indicates that participants with a job grade of BBU experience higher levels of Cynicism compared to participants with a job grade of PPP/MMM. A statistically and practically significant difference (large effect) exists between Paterson job grade BBU (semi-skilled to skilled category) and Paterson job grade PPP/MMM (professional and managerial category). The results indicate that participants with a job grade of BBU experience lower levels of Professional Efficacy compared to participants with a job grade of PPP/MMM.

A more comprehensive test of the hypothesised relationships can be accomplished with structural equation modelling (SEM) methods as implemented by AMOS (Arbuckle, 1999). A model was constructed based upon the results of the canonical correlations and the consensus of findings from a review of the literature on burnout, as it bears on the work environment of engineers, technicians and electricians.

The fit of the hypothetical model was assessed by 1) a quick overview of the overall  $\chi^2$  value, together with its degrees of freedom and probability, and 2) global assessment of model fit

based on several goodness-of-fit statistics (GFI, AGFI, PGFI, NFI, TLI, CFI and RMSEA). Given findings of an ill-fitting initially hypothesised model, possible misspecifications as suggested by the so-called modification indexes were looked for and eventually a revised, re-specified model was fitted to the data.

*The hypothesised model*

The formulation of the hypothesised model is shown in Figure 1. As can be seen, burnout is represented as multidimensional construct with Exhaustion, Cynicism and Professional Efficacy operating as conceptually distinct factors. The paths leading from job stress (Job Demands, Lack of Support, Supervision and Transformation), coping strategies and sense of coherence variables to the three dimensions of burnout reflect findings in the literature. However, Seeking Social and Emotional Support and Turning to Religion did not play any role in the hypothesised model. Selected goodness-of-fit statistics related to the hypothesised model (Model 1) are presented in Table 7.

Table 7

*Goodness-of-Fit Statistics for the Causal Model*

Model	$\chi^2$	$\chi^2/df$	GFI	AGFI	NFI	TLI	CFI	RMSEA
Default model	52,00	1,73	0,95	0,92	0,92	0,95	0,97	0,06

The proposed model, including the hypothesised relationships, was tested by SEM analysis. Results indicated that the model did fit adequately to the data (see Table 7). Inspection of the modification indices (MI) revealed that the fit between the model and the data could be further improved if correlation was allowed between the measurement errors of job characteristics dimensions. It is important to note that items with identical rating scales often have measurement errors that are correlated (Byrne, 2001).

As can be seen in Figure 1, the path from sense of coherence to job stress is statistically significant, while the path from job stress to exhaustion is also statistically significant. This indicates a causal sequence among sense of coherence, job stress and exhaustion (i.e. a mediating effect). Furthermore, the paths from job stress to exhaustion and cynicism, and the

path from exhaustion to cynicism are statistically significant. This indicates that the effect of job stress on cynicism depends on the level of exhaustion (i.e. a moderating effect). In addition, the paths from avoidance to sense of coherence and from avoidance to cynicism are statistically significant, which confirms a causal sequence between sense of coherence, avoidance and cynicism. The statistically significant paths from sense of coherence to job stress and active coping as well as from active coping to job stress indicate that active coping moderates the effect of sense of coherence on job stress. Active coping also moderates the effect of sense of coherence on professional efficacy.

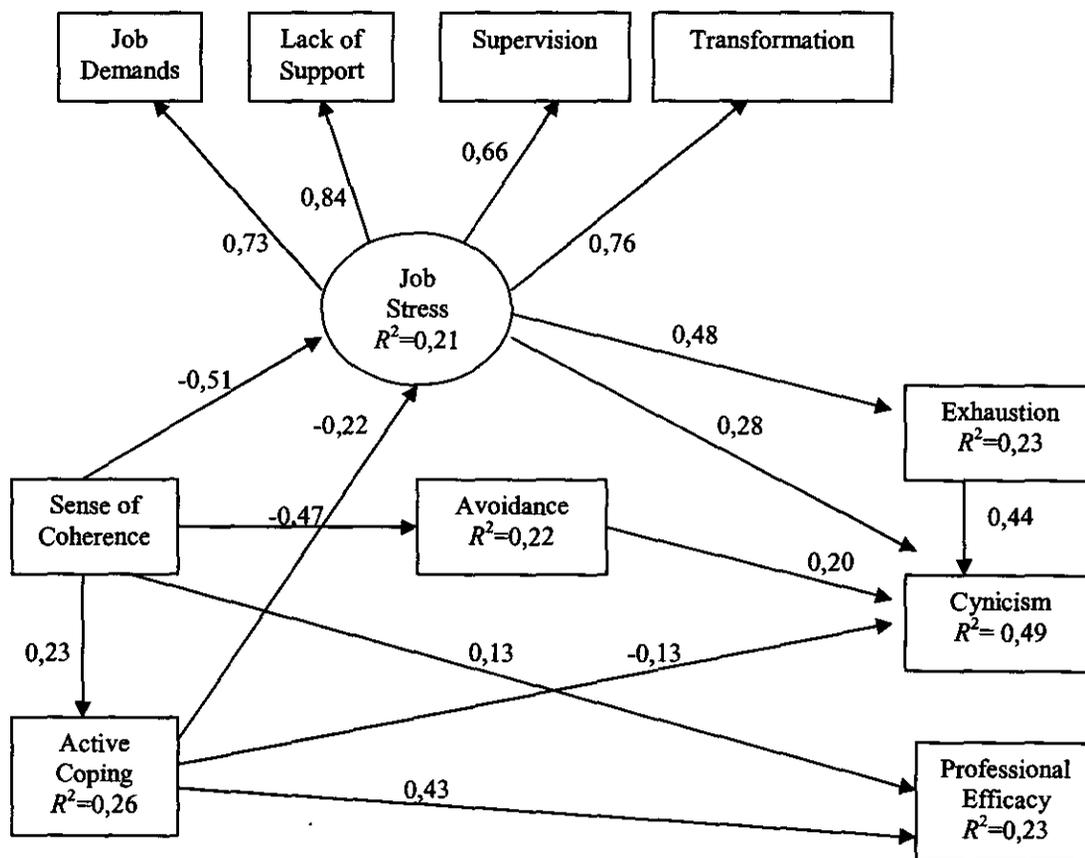


Figure 1. The model of job stress, sense of coherence, coping and burnout

## DISCUSSION

The results obtained from the MBI-GS using the structural equation modelling approach supported a three- dimensional factor structure, as has been consistently found across various

samples, occupational groups and countries (Leiter & Schaufeli, 1996; Schaufeli et al., 1996; Schaufeli et al., 2002; Storm, 2002; Taris, Schreurs & Schaufeli, 1999). The internal consistencies of MBI-GS, JSI, OLQ and COPE were also acceptable.

Stress because of a lack of support, job demands and transformation were positively related to exhaustion and cynicism. Active coping was positively related to the other coping strategies, such as seeking emotional support and turning to religion, but only active coping was positively related to professional efficacy. Exhaustion was positively related to cynicism.

Electricians showed a higher level of cynicism than engineers and technicians. The results also showed a significant difference in the professional efficacy of engineers, technicians and electricians. Electricians show reduced levels of professional efficacy compared to engineers and technicians. The reason for this significant difference might be that the electrician is the front line person who has to build, repair and maintain equipment, products or services and is spending a considerable time under conditions of chronic stress and tension (Burke, 1997; Greenglass, Burke & Konarski, 1998; Mills & Huebner, 1998).

Employees working in field services experienced higher levels of cynicism compared to the electricity delivery and network services. A possible explanation for this is that the majority of electricians are employed in field services, technicians in electricity delivery and engineers in network services. The main responsibility of field services is to ensure quality of supply to end users and to restore power interruptions with the minimum of inconvenience to customers

This results do not support findings of previous studies (Cherniss, 1980; Künzel & Schulte, 1986; Maslach et al., 1996) that less experienced employees report greater incidence of burnout. Employees with a lower job grade show practically significant higher levels of cynicism and lower levels of professional efficacy compared with those with a higher job grade. The employees with lower job grades are the electricians and junior technicians. Their core outputs are to build, maintain and repair, whereas senior technicians and engineers are more involved in design and monitoring of the plant. An explanation might be that the lower job grades lack the necessary coping skills. They learn by trail and error to handle stressful situations and are inclined to revert to that specific coping style when the same situation

arises. Antonovsky (1987) and Feldt (1997) suggest that the availability of a wide repertoire of coping strategies and flexibility in choice at any given time, is crucial. More senior employees are given the opportunity to attend courses in personal development, hence their increased ability to cope.

The structural model that was developed for the purpose of this study confirmed a causal sequence between sense of coherence, job stress and exhaustion. Therefore, it seems that employees who have a weak sense of coherence are inclined to suffer from job stress, which will lead to exhaustion. Employees who have a weak sense of coherence probably find it difficult to structure their world to be understandable, orderly and consistent. They tend to experience life events as unmanageable and perceive that they lack the resources to meet the demands and they might feel that life does not make sense on an emotional level (Antonovsky, 1987). It is understandable that they would perceive situations as stressful. The results also showed that active coping strategies interacted with sense of coherence in influencing job stress. Therefore, the effect of sense of coherence on job stress will also depend on the level of active coping demonstrated by employees.

Job stress interacted with exhaustion in influencing cynicism. This means that the effect of job stress on cynicism will depend on an employee's level of exhaustion. Storm (2002) also found that exhaustion and cynicism are strongly related. However, it was clear that sense of coherence and coping strategies also had an effect on cynicism. More specifically, the results showed that active coping and avoidance mediated the relationship between sense of coherence and cynicism.

Sense of coherence and the use of active coping strategies seem to contribute to the professional efficacy of employees. This finding confirms the findings of Rothmann, Jackson and Kruger (2003). Active coping strategies moderated the effects of sense of coherence on professional efficacy. This finding proves that a strong sense of coherence should be accompanied by active coping strategies in order to promote a feeling of professional efficacy. This finding support the suggestion made by Antonovsky (1987) that the sense of coherence accompanied with effective coping may lead to health-enhancing behaviours and better social adjustments.

Sense of coherence and active coping strategies explained 26% of the variance in job stress. Job stress explained 23% of the variance in exhaustion, while exhaustion, low active coping and avoidance explained 49% of the variance in cynicism. Sense of coherence and active coping explained 23% of the variance in professional efficacy.

This study had various limitations. Firstly, the research design was cross-sectional, which makes it difficult to prove causality of obtained results. Secondly, self-report measures were exclusively relied on. Therefore, at least part of the common variance of the measures has to be attributed to method variance (Schaufeli, Maslach & Marek, 1993). For example, Cherniss (1980) argues that the withdrawal from customers or work, which closely resembles avoidance coping, has been regarded as a core symptom of burnout. Cynicism is also characterised by behaviour that includes mental or behavioural withdrawal (Maslach, 1982a). Accordingly, avoidance coping and cynicism overlap conceptually. Thirdly, the findings cannot be generalised to engineers, technicians and electricians in other electricity distribution organisations, due to the sample size and organisation specifics.

## **RECOMMENDATIONS**

In order to alleviate burnout, the electricity distribution organisation should design and implement planned interventions. Although it is important to assist individual engineers, technicians or electricians whose psychological well-being is affected by their work, an organisational rather than an individual approach is more likely to be effective, as most stressors were found to be on a organisational level. Probably the best solution to workplace burnout is to dig deeper into the stressors, as well as into how this organisation contributes to the stressors that cause burnout. The intent is to make the organisation inherently less stressful. Since lack of support plays a central role in burnout, it is necessary to implement preventative organisation-based solutions to tackle the problem of lack of support. However, further research is needed to determine reliability and validity of the JSI for engineers, technicians and electricians in other electrical distribution organisations.

The organisation can contribute to the development of the employee's sense of coherence by giving information in a constant, structured, ordered and understandable format. Employees should further be able to identify their roles within the greater whole and as such the

comprehensibility component of sense of coherence. Also, it is important to focus on the engineers, technicians and electricians coping strategies. The study indicates that the needs of employees in the electrician category, with a job grade of BBU or CCL need to be addressed first. Training and development programmes that are directed at developing sense of coherence and coping with stress should be compiled and evaluated.

Several suggestions for future research have been derived from the present findings. In conjunction with studying the obvious factors that are believed to be related to burnout in engineers, technicians and electricians, it is also necessary to include cognitive and personality variables in future research. Also an exploration of the underlying personality traits that produce different coping patterns and preferences should be undertaken. Future studies should use large samples and adequate statistical techniques (e.g. structural equation modelling). Large samples sizes might provide increased confidence in the psychometric value of the measurement instruments.

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## **CHAPTER 3**

### **CONCLUSIONS, LIMITATIONS AND RECOMMENDATIONS**

This chapter encompasses conclusions regarding the literature review and the empirical study. Thereafter the limitations of the research are mentioned. Lastly recommendations in terms of the research problem are presented, and future research suggestions are proposed.

#### **3.1 CONCLUSIONS**

The general aim of the research was to investigate the relationship between sense of coherence, coping, job stress and burnout of engineers, technicians and electricians in an electricity distribution organisation. The following conclusions are derived pertaining to the constructs of sense of coherence, coping, job stress and burnout.

Burnout is a process initiated by extremely intensive and long-term stress and tension in the working environment. Burnout is a syndrome that consists of three dimensions, namely exhaustion, cynicism and professional efficacy. Exhaustion refers to a pattern of emotional overload and subsequent feelings of being overextended. Cynicism relates to the interpersonal dimension of burnout and results in a negative, callous or excessively detached response to various aspects of the job, and professional efficacy refers to the self-evaluation dimension of burnout and is a feeling of competence, productivity and achievements at work.

Sense of coherence is a global orientation that expresses the extent to which one has a pervasive, enduring though dynamic feeling of confidence that one's internal and external environments are predictable and that there is a high probability that things will work out as well as can reasonably be expected. Each person's sense of coherence requires certain inherent prerequisites for coping successfully, namely comprehensibility, manageability and meaningfulness. Comprehensibility refers to the extent to which a person finds or structures their world to be understandable, meaningful, orderly and consistent instead of chaotic, random and unpredictable.

Manageability refers to the extent to which people experience events in life as situations that are endurable or manageable or even as new challenges. Meaningfulness refers to the extent to which one feels that life make sense on an emotional and not just on a cognitive level.

Coping can be described as the efforts we make to manage situations we have appraised as potentially harmful or stressful. Two elements of coping exist, namely problem-focused and emotion-focused. Problem-focused coping is directed at eliminating an unpleasant experience or reducing the efforts thereof, whereas emotion-focused coping is directed at reducing the effects of stressful feelings caused by an unpleasant experience.

Stress is defined in terms of a disruption of the equilibrium of the cognitive-emotional-environmental system by external forces. These external factors, traditionally called stressors, may also lead to equilibrium of the cognitive and environmental system or a state of well-being, depending on the performance capacities, such as the available coping strategies within the individual at a given time, for example. Organisational stressors are more prevalent than inherent stressors. Organisational stressors can be divided into two groups, namely job demands and a lack of job resources.

From the literature it can be concluded that people in almost any occupation are subject to burnout. Furthermore, an increase in occupational stressors accompanied by a weak sense of coherence and inadequate coping strategies contribute to burnout.

Conclusions made with reference to the empirical objectives are reflected below.

Sense of coherence was positively related to work engagement and negatively related to exhaustion, cynicism, job stress and avoidance coping. Job stressors (including lack of support, supervision, job demands and transformation) were positively related to exhaustion and cynicism. It seems that although job stressors contribute to exhaustion and cynicism, engineers, technicians and electricians still maintain some professional efficacy, due to problem-focused coping strategies like active coping, seeking emotional support and turning to religion. Avoidance coping was positively related to cynicism.

Sense of coherence and active coping had a significant positive influence on work engagement. Lack of support was the most prominent stressor reflecting items such as poorly motivated co-workers, insufficient personnel to handle an assignment, working with incompetent employees, excessive paperwork, fellow workers not doing their job, staff shortages, covering work for another employee, conflicts with other departments, meeting deadlines, frequent interruptions and personal insult from customer/consumer/colleague.

Transformational stressors included items such as inadequate salary, competition for advancement, lack of opportunities for advancement, concerned about the future of one's career, lack of recognition for good work, re-organisation and transformation within the organisation and experiencing negative attitudes towards the organisation.

Job demands included items such as working week-ends, doing stand-by duties, assignment of increased responsibilities, working overtime, dealing with crisis situations and performing tasks not in job description. Supervision included items such as inadequate support by supervisor, difficulty getting along with supervisor, poor or inadequate supervision, assignment of new or unfamiliar duties, periods of inactivity and too much supervision.

Differences in the level of burnout between engineers, technicians and electricians showed that electricians experience high levels of cynicism. This result is also evident in the differences amongst divisions, because the majority of electricians work in the field services department. Differences between burnout and educational levels, years of service and job grade contradicts previous studies in that employees with lower educational levels, more than 10 years service and employees with a lower job grade experience high levels of burnout and feelings of reduced professional efficacy.

From the results it can be concluded that engineers, technicians and electricians are prone to burnout just like people in any other occupation. Job stress was associated with high levels of lack of support, transformation, job demands and supervision. A positive relationship was found between job stress, exhaustion and cynicism. Job stress, especially because of a lack of support, impacts negatively on sense of coherence.

The following conclusions are made based on the structural equation modelling:

- Job stress impacts on exhaustion and sense of coherence, but a strong sense of coherence moderates the effect of job stress on exhaustion. Accordingly, it seems that sense of coherence reduces the effects of job stress on exhaustion. Sense of coherence also protects employees from developing low professional efficacy. Employees with a strong sense of coherence experience less exhaustion because stimuli from the environment are perceived as making cognitive sense, as being under the control of both the individual and legitimate others, and as motivationally relevant and meaningful.
- Active coping strategies moderate the effects of sense of coherence on professional efficacy. Therefore, a strong sense of coherence should be accompanied by active coping strategies in order to promote a feeling of professional efficacy.
- Avoidance as a coping strategy mediates the relationship between sense of coherence and cynicism.

### **3.2 LIMITATIONS**

This study had the following limitations:

- The research design was cross-sectional, which makes it difficult to prove causality of obtained results.
- Self-report measures were exclusively relied upon. This causes a particular problem in validation studies that use self-reported measures exclusively because a least part of the common variance of the measures has to be attributed to method variance (Schaufeli, Maslach & Marek, 1993).
- The findings cannot be generalised to engineers, technicians and electricians in other electricity distribution organisations, due to the sample size and organisation specifics.

- The organisation has been bombarded with other in-house surveys, e.g. employee satisfaction and leadership style questionnaires, and hence a possible negative attitude towards the completion of questionnaires exists. The possibility of language interpretations of the questionnaires could have influenced the validity and reliability of the results, because all the questionnaires were in English.

### **3.3 RECOMMENDATIONS**

Recommendations for the organisation and future research are made in this section.

#### **3.3.1 Recommendations for the organisation**

In order to alleviate burnout, the electricity distribution organisation should design and implement planned interventions. The intent is to make the organisation inherently less stressful. The first step is to get organisational buy-in. The success of any planned interventions lies in the recognition by the leadership that burnout is alive and kicking in the organisation, and support from management for planned interventions. The establishment of a work wellness project team that can dig deeper into the stressors and identify how this organisation contributes to the stressors that cause burnout, is recommended.

With the focus on research and development, the work wellness team can identify factors that contribute to wellness at work in multicultural contexts. They can then develop, implement and evaluate interventions that could be used to ensure wellness at work and ultimately the effectiveness of the organisation. Furthermore, the work wellness team needs to encourage employee involvement programmes, where small teams can develop solutions to workplace issues. The scope of the work wellness project team may be extended towards further research in terms of the job-person paradigm and other relationships with burnout, such as engagement, psychological strengths and ethical behaviour. The initial emphasis will be on the six areas of the worklife framework (Maslach & Leiter, 1997) that encompass the major organisational antecedents of burnout, namely workload, control, reward, community, fairness and values.

Furthermore, the organisation can contribute to the development of the employee's sense of coherence by giving work wellness information in a constant, structured, ordered and understandable format. Employees should further be able to identify their roles within the greater whole and as such the comprehensibility component of sense of coherence. Also, it is important to focus on the engineers, technicians and electricians coping strategies. Although active coping is the major coping strategy, the high levels of cynicism/depersonalisation need to be attended to. The study indicates that the needs of employees in the electrician category, with more than 10 years service and with a job grade of BBU and CCL should be addressed first. Training and development programmes that are directed at developing sense of coherence and coping with stress should be compiled and evaluated.

The problem-solving process will be one of continuous assessment and evaluation as positive change comes over time. For this and any other organisation to have a long-term chance of survival in the marketplace, investment in the health and happiness of their people is paramount.

### **3.3.2 Recommendations for future research**

Several suggestions for future research have been derived from the present findings. In conjunction with studying the obvious factors that are believed to be related to burnout in engineers, technicians and electricians, it is also necessary to include cognitive and personality variables in future research. Also an exploration of the underlying personality traits that produce different coping patterns and preferences should be undertaken. These studies can be incorporated in the sourcing and selection process of prospective engineers, technicians and electricians. Future research can also include the relationship between sense of coherence, job stress, coping, burnout, ethical (and non-ethical) behaviour, incapacity and occupational incidents.

Future studies should use large samples and adequate statistical techniques (e.g. structural equation modelling). Large samples sizes might provide increased confidence in the psychometric value of the measurement instruments.

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