

**Stress, coping behaviour and the psychological well-being of a group of South African
teachers: The SABPA Study**

Marilize Willers

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21364597

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Supervisor:	Dr. J.C. Potgieter
Co-supervisor:	Mr. I. P. Khumalo
Assistant supervisor:	Prof. P.J. Mentz
Assistant supervisor:	Prof. L. Malan

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2. SUMMARY

Stress, coping behaviour, and the psychological well-being of a group of South African teachers: The SABPA study

The aim of this study was to examine the effects of coping behaviour on the stress and psychological well-being as experienced by South African teachers. A review of relevant literature revealed that the teaching profession is an extremely stressful occupation globally. Factors contributing to the stress that teachers experience include the downsizing of the number of teachers in schools and insufficient training being provided for teachers. Exposure to these chronically stressful conditions has psychological and physical consequences for some teachers. Numerous studies, however, have also pointed out that some teachers, in the same teaching environment, experienced less stress and had better physical health than others. In an effort to gain clarity on these contradictory findings, many studies regarding the effect of various coping behaviours have been undertaken. No literature could, however, be found regarding the different coping behaviours used by African teachers and which strategies proved a success. Therefore, the aim of this study was to investigate the effect that coping behaviour had on the level of stress, as well as the psychosocial well-being, experienced by black South African teachers.

The current study was conducted as part of the SABPA (Sympathetic Activity and Ambulatory Blood Pressure in Africans) project conducted at the North-West University. Data for this sub study was collected through a cross-sectional design and the statistical consulting services of the university were involved in the analysis of the raw data.

The Teacher Stress Inventory (TSI) (Boyle, Borg, Falzon, & Baglioni, 1995), the Coping Strategy Indicator (CSI) (Amirkhan, 1990), and the Mental Health Continuum-Short Form (MHC-SF) (Keyes, 2006) were administered to 200 urban African teachers residing in the Kenneth Kahunda district in the North West Province. The TSI was administered as a self report measure of occupational stress in teachers. The CSI was administered to all the participants in an attempt to establish what coping strategies were employed by them. It consists of three subscales (problem solving, avoidance, and seeking social support) which are independent of one another and, according to the authors, free from demographic influences. The MHC-SF was administered to all the participants as a measure of well-being. The MHC-SF places individuals on a continuum which ranges between complete mental health (flourishing) to incomplete mental health (languishing). Those who are neither flourishing nor languishing are said to be moderately mentally healthy.

All the measures that were administered proved to be reliable and thus interpretable, except for the subscales of the TSI. Therefore, only the TSI total scale score was used for interpretation. Results indicated that this group of teachers were experiencing high levels of stress and were making above average use of all three coping behaviours to deal with their stressors. 70% of the teachers were reportedly moderately mentally healthy, while 2% of them were languishing, and only 28% of them were flourishing. Of these teachers, those who reported smoking and alcohol use as a coping behaviour were experiencing less stress than those who abstained. These results were, however, only of small to medium practical significance.

Intercorrelational results indicated that, although stress levels were high, stress had no direct and significant relation to either coping or well-being. The use of certain coping strategies, however, correlated positively with some aspects of mental health. In order to elucidate the nature of the relationships that seemed to exist between these constructs, path analysis was conducted.

Structural Equation Modelling (SEM) results revealed a strong negative path between the use of avoidance as a coping strategy and the emotional well-being of participants. A direct significant path was reported between seeking social support and the social well-being of this group of teachers. Another significant finding was the existence of a direct path between problem solving and the social and psychological well-being reported by participants.

The implications of these results, as well as the possible shortcomings of the current study and its limitations, were discussed.

In conclusion, the results indicated that coping behaviour had little effect on the amount of stress that the teachers experienced, although it seems that coping behaviour does have a significant effect on some aspects of mental health.

2.1 KEY WORDS

Stress; Teacher Stress Inventory (TSI); coping behaviour; Coping Strategy Indicator (CSI); psychological well-being; Mental Health Continuum-Short Form (MHC-SF); South African context.

3. OPSOMMING

Stres, coping gedrag, en die psigologiese welstand van 'n groep Suid-Afrikaanse onderwysers: Die SABPA studie

Die doel van die hierdie studie was om die effek van coping gedrag op stresvlakke en psigologiese welstand van 'n groep Suid-Afrikaanse onderwysers te bepaal. 'n Oorsig van bestaande literatuur het getoon dat die onderwys profesie wêreldwyd as 'n baie stresvolle beroep beskou word. Faktore wat bydra tot die stres wat onderwysers ervaar sluit in die vermindering van aantal onderwysers in skole, en die onvoldoende opleiding van onderwysers. Die blootstelling aan hierdie kroniese stresvolle omstandighede het psigologiese sowel as fisiologiese gevolge vir sommige onderwysers. Verskeie studies het egter ook getoon dat sekere onderwysers wat hulle in dieselfde onderwysomgewing bevind, minder stres ervaar en beter fisiese gesondheid beleef as ander. In 'n poging om lig te werp op hierdie teenstrydige bevindinge, is vele studies aangaande die effek van verskillende vorme van coping onderneem. Geen literatuur kon egter gevind word aangaande die coping gedrag wat deur Afrika-onderwysers gebruik word nie, en watter strategieë die beste werk nie. Die doel van hierdie studie was derhalwe om die effek van coping gedrag op die stresvlak en psigologiese welstand van 'n groep Swart Suid-Afrikaanse onderwysers te bepaal.

Die huidige studie is onderneem as deel van die SABPA (Sympathetic Activity and Ambulatory Blood pressure in Africans) projek by die Noordwes-Universiteit. Data vir die huidige studie is ingesamel deur 'n dwarsdeursnit ontwerp en die statistiese konsultasie dienste van die Noordwes-Universiteit is gebruik vir die verwerking van die data.

Die "Teacher Stress Inventory (TSI) (Boyle, Borg, Falzon, & Baglioni, 1995), Coping Strategy Indicator (CSI) (Amirkhan, 1990) en die Mental Health Continuum-Short Form (MHC-SF) (Keyes, 2006)" is voltooi deur 200 stedelike onderwysers afkomstig van die Kenneth Kahunda-distrik in die Noordwes-Provinsie. Die TSI is ingesluit as 'n selfrapporteringsmaatstaf van stres ervaar deur onderwysers. Die CSI is voltooi deur al die deelnemers ten einde hul coping gedrag te identifiseer. Dit bestaan uit drie subskale (Probleemoplossing, vermyding en die soeke na sosiale ondersteuning) wat onafhanklik is van mekaar en volgens die outeurs vry is van demografiese invloede. Die MHC-SF is voltooi deur al die deelnemers as 'n maatstaf vir geestesgesondheid. Die MHC-SF plaas individue op 'n kontinuum tussen volkome geestesgesondheid (florerend) tot onvolkome geestesgesondheid (smagtend). Diegene wat nie florerend of smagtend is nie, word

beskou as dat hul matige geestesgesondheid beleef. Al die vraelyste wat gebruik is het voldoen aan betroubaarheidsmaatstawwe en was dus interpreteerbaar, behalwe vir die subskale van die TSI. Slegs die TSI se totaalskaaltelling is derhalwe gebruik vir interpretasie. Resultate het aangedui dat hierdie groep onderwysers hoë vlakke van stres ervaar en dat hulle tot 'n bogimmedelde mate gebruik maak van al drie die genoemde coping strategieë om hierdie stressore te hanteer. Soos gerapporteer deur die onderwysers blyk dit dat 70% van hulle matig geestesgesond is, 2% van die onderwysers smagtend is en 28% florerend is. Die onderwysers wat rook en van alkohol gebruik maak as coping gedrag het minder stres gerapporteer as die wat hulself weerhou daarvan. Hierdie resultate was egter van klein tot medium praktiese beduidendheid.

Interkorrelasies het aangedui dat, alhoewel die gerapporteerde stresvlakke hoog was, hierdie stres geen direkte of betekenisvolle verband toom met coping of die welstand van deelnemers nie. Die gebruik van sekere coping strategieë het egter positief gekorreleer met sekere aspekte van geestesgesondheid. Ten einde lig te werp op die aard van hierdie verbande is roete-analise gedoen.

Resultate van strukturele vergelykingsmodelle (SEM) het getoon dat daar 'n sterk, negatiewe verband bestaan tussen die gebruik van vermyding as coping strategie, en die emosionele welstand van die deelnemers. 'n Sterk verband is ook gevind tussen sosiale ondersteuning en die sosiale welstand van die groep onderwysers. 'n Verdere beduidende bevinding was die bestaan van 'n direkte verband tussen probleemoplossing en die sosiale- sowel as psigologiese welstand gerapporteer deur die onderwysers.

Die implikasies van hierdie resultate, sowel as die moontlike tekortkominge van die huidige studie is bespreek.

Die resultate het aangedui dat coping gedrag 'n minimale effek het op die hoeveelheid stres wat die onderwysers beleef. Dit blyk egter dat sekere coping strategieë 'n beduidende effek het op seker aspekte van geestesgesondheid.

3.1 SLEUTELWOORDE

Stres, "Teacher Stress Inventory (TSI)", coping gedrag, "Coping Strategy Indicator (CSI)", psigologiese welstand, "Mental Health Continuum-SF (MHC-SF)", Suid-Afrikaanse konteks.

4. MANUSCRIPT

Stress, coping behaviour, and the psychological well-being of a group of South African teachers: The SABPA study

M. Willers, J. C. Potgieter, I. P. Khumalo, L. Malan*, and P. J. Mentz**

School for Psychosocial Behavioural Sciences, North-West University (Potchefstroom Campus), South Africa

** School for Physiology, Nutrition and Consumer Sciences, Faculty of Health Sciences, North-West University (Potchefstroom Campus), South Africa*

*** School of Education, North-West University (Potchefstroom Campus), South Africa*

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STRESS, COPING BEHAVIOUR, AND THE PSYCHOLOGICAL WELL-BEING OF A GROUP OF SOUTH AFRICAN TEACHERS: THE SABPA STUDY

AUTHORS AND ADDRESSES

M. Willers, J. C. Potgieter, I. P. Khumalo, L. Malan*, and P. J. Mentz**

School for Psychosocial and Behavioural Sciences, North-West University (Potchefstroom Campus), South Africa

** School for Physiology, Nutrition and Consumer Sciences, Faculty of Health Sciences, North-West University (Potchefstroom Campus), South Africa*

*** School of Education, North-West University (Potchefstroom Campus), South Africa*

Johan C. Potgieter*

Department of Psychology

School for Psychosocial and Behavioural Sciences

North-West University, Potchefstroom Campus

Private Bag X6001

Potchefstroom

2520

South Africa

Email: johan.potgieter@nwu.ac.za

* To whom correspondence should be addressed

ABSTRACT

This study, performed as part of the SABPA (Sympathetic Activity and Ambulatory Blood Pressure in Africans) project, examined the effects of different coping behaviours (problem solving, seeking social support, and avoidance) on the stress levels and psychological well-being of 200 urbanized African teachers from the North West Province. A cross sectional design was used. Instruments that were administered included the 33-item Coping Strategy Indicator (CSI), the 14-item Mental Health Continuum-Short Form (MHC-SF), and the 20-item Teacher Stress Inventory (TSI). Data that was analysed using SPSS revealed these participants' working environment to be perceived by them as highly stressful which confirms the literature in this regard. These teachers were making above average use of all three of the coping behaviours that were being evaluated. Of these teachers, 2% were languishing, 28% were flourishing, and 70% were moderately mentally healthy. Correlation results indicated significant positive associations between coping and some aspects of mental health. Structural Equation Modelling (SEM) that was performed in order to get an indication of the causal relationships between measured variables did not reveal a relationship between stress and well-being. A direct positive influence was, however, found between the use of problem solving as a coping strategy and the level of teacher stress that was reported. This result differs from what is usually found in Western cultures. It seems that the coping behaviours that were used by these teachers had a significant effect on their mental health, thus implying that it might not be the amount of stress experienced that influences teachers' mental health, but rather the way in which they choose to cope with it. These results might inform and help to shape practices in the changing and challenging South African educational environment.

Key words

Stress; Teacher Stress Inventory (TSI); coping behaviour; Coping Strategy Indicator (CSI); psychological well-being; Mental Health Continuum-Short Form (MHC-SF); South African context.

STRESS, COPING BEHAVIOUR, AND THE PSYCHOLOGICAL WELL-BEING OF A GROUP OF SOUTH AFRICAN TEACHERS: THE SABPA STUDY

Teachers increasingly report that the environments in which they work are very stressful. Kyriacou (2001) stated that some of the contributing environmental stressors that teachers experience include working with unmotivated learners, maintaining discipline, and handling a very heavy workload, as well as factors such as being evaluated by others and poor working conditions. These authors defined teacher stress as a combination of unpleasant or negative emotions, including anger, anxiety, tension, frustration, or depression, experienced as a result of various challenging aspects of their work.

Naring, Briet, and Brouwers (2006) found that teaching also involves intense emotional labour because of the “surface acting” that teachers do every day in their classrooms. “Surface acting” involves an individual showing emotions that he or she does not really experience, as well as suppressing prominent emotions that he or she does experience. This, in turn, produces more stress for the individual. The implementation of the outcomes based curriculum approach in schools has placed greater responsibility on teachers in South Africa (Vandeyar, 2005). In terms of the National Qualifications Framework (NQF), teachers have to assess learners’ progress continually without passing or failing them (Ngidi & Sibaya, 2002). An additional source of stress amongst South African teachers includes the downsizing of the number of teachers in schools, leading to high learner-teacher ratios (Ngidi & Sibaya, 2002; Olivier & Venter, 2003). In many instances, South African teachers also have to cope with multi-racial classrooms which require them to teach in their second language, and also to work with individuals from other cultures whose backgrounds they do not understand. According to Vandeyar (2005), this new multi-cultural context within which teachers need to operate only adds to an already difficult situation. As a result of the increasing awareness of teachers’ constant exposure to situations which, in the long term, can lead to chronic teacher stress, much research has recently highlighted the very stressful nature of the teaching occupation (Kokkinos, 2007; Van Dick & Wagner, 2001; Yong & Yue, 2007).

The effects of stress on individuals and their functioning are multiple at both physiological and psychological levels. Some of the important psychological effects that people experience in response to chronic stress are reduced psychological well-being (Bach, 2000) and burnout, which is associated with cynicism and exhaustion (Mearns & Cain, 2003). On a physiological level, stress, which according to De Kooker (2008) begins as an actual or perceived threat, activates systems in

the brain that respond to threats. These activating systems produce, amongst other things, the release of adrenalin and glucocorticoids which, in the long run, suppress immune sufficiency and causes disease susceptibility (De Kooker, 2008; Folkman & Moskowitz, 2000). Other physical complaints such as headaches, muscular tension, and physical pain were reported by teachers experiencing stress in a South African study on stress and ill health done by Jackson and Rothman (2005).

A study by Ngidi and Sibaya (2002) found that a large percentage of teachers from several different countries indicated high levels of occupational stress. Research done in South Africa by Olivier and Venter (2003) in the George area found that 20% of the teachers were suffering from severe stress as measured with the Fimian Teacher Stress Inventory. In contrast, studies in the former Transkei conducted amongst African secondary school teachers showed that 91.3% reported only average levels of stress (Mwamwenda, Monyooe & Glencross, 1997). This interesting finding coincides with research by Mearns and Cain (2003) which suggests that not all teachers will experience the negative effects usually associated with chronic stress, even though they are exposed to high levels of work stress. These differences could be accounted for by the resources associated with their environmental setting. Yet the inconsistencies in research results regarding teachers and stress have recently brought the much debated question of why some people cope better with stressful situations than others to the fore (Folkman & Moskowitz, 2004). Recent studies have increasingly emphasized the role that psychological strengths play when dealing with stressful situations. In these studies, importance has been placed on the identification of strengths and coping strategies that can aid in the development and maintenance of psychological health (Valle, Huebner & Saldo, 2006).

Coping can be referred to as a variety of behavioural and cognitive strategies that individuals employ in order to manage their stress (Folkman & Moskowitz, 2004). According to Moos and Holahan (2003), this is a dynamic process that fluctuates over time in response to changing demands. The individual's coping ability has long been considered to be relevant in the experience and treatment of physical and emotional distress (Lazarus & Folkman, 1984), also within the context of work. Brown, Westbrook, and Challagalla (2005) found that, when effective coping strategies are absent after a negative work event, negative emotions will follow that affect work performance. According to these authors, certain coping responses can either buffer or aggravate these negative effects. A possible explanation for this might be that coping cannot be viewed in isolation and that personality, environment, and other factors also play a role. As far as teacher

stress is concerned, literature that explains which coping mechanisms are used by African teachers and how these mechanisms affect their psychological well-being and their physical health is scarce. The few research studies that exist have found that, in the absence of effective coping strategies, individuals turn to negative coping behaviour such as smoking, binge eating, and alcohol use (Folkmann & Moskowitz, 2004; Litman, 2006; Olivier & Venter, 2003). These behaviours, in turn, have a negative influence on individuals' physical health. According to the 2007 Guidelines for the Management of Arterial Hypertension, smoking and the use of alcohol increases blood pressure levels and the prevalence of hypertension, which causes an increased risk of a stroke. Thus, the negative implication of high stress levels in combination with ineffective coping behaviour on the physical health of individuals is evident.

A literature review of studies focusing on the coping behaviours used by teachers after the recent changes in the South African educational environment provided little results. This absence of recent research highlights the importance of studies within the high stress context of teaching, that gives eminence to the use of certain types of coping behaviour (Brown et al., 2005), and how they affect psycho-physiological health and well-being.

The aim of this research was thus to examine the effects of coping behaviour on stress and the psychological well-being of African teachers. The uniqueness of this study precipitates from the fact that the three variables (coping, stress, and well-being) will be combined into one study in order to examine the relationships that exist between them.

METHOD

Design

The current study was conducted as part of the SABPA (Sympathetic Activity and Ambulatory Blood Pressure in Africans) and FORT 3 (Fortology: Biomarkers and psychological (ill-) health) projects. Data for the SABPA project was collected through the use of a cross-sectional design with a purposively selected study population. Statisticians of the North-West University Statistical Consulting Services were involved in the statistical analysis of the data.

Participants

The research sample consisted of 200 (101 male and 99 female), black, urban African teachers residing in Kenneth Kahunda district of the North West Province, aged between 25 and 65 years. Exclusion criteria regarding the SABPA project consisted of the following: being pregnant or lactating, using alpha- and beta-blockers, having a temperature above 37° Celsius, and having donated blood or been vaccinated in the three months prior to the study. Additional descriptive information for this participant group is provided in Figure 1.

[Figure 1]

Measures

The Teacher Stress Inventory (TSI) (Boyle, Borg, Falzon & Baglioni, 1995)

The Teacher Stress Inventory (TSI) is a 20-item self-report scale with a five point Likert type response format measuring the occupational stress experienced by teachers. The TSI was administered to all participants as a self rating scale.

Boyle et al. (1995) derived the TSI from the 51 sources of stress identified by Kyriacou and Suthcliff (1978). Participants were requested to answer the question, “As a teacher, how great a source of stress are these factors to you?” when presented with different stressors. Response options included, and were limited to, ‘no stress’, ‘mild stress’, ‘moderate stress’, ‘much stress’, and ‘extreme stress’. Factor analysis conducted by the authors of the scale produced five subscales which included workload, student misbehaviour, poor colleague relations, professional recognition, and time/recourse difficulties. Although the same subscales were not reproduced in this South African context, a Cronbach alpha reliability index of 0.91 was produced for the total scale score. Confirmatory Factor Analysis (CFA) for this study revealed a Tucker-Lewis index of 0.71 which was smaller than the guideline value of 0.9. A chi-square value of 2.96 was reported with a RMSEA of 0.07 and a 90% confidence interval of [0.06; 0.08] for which the lower confidence limit is equal to the guideline value of 0.06. Although not complying with the guidelines for a good fit, these measures can be taken as an indication of a satisfactory fit.

Coping Strategy Indicator (CSI) (Amirkhan, 1990)

The Coping Strategy Indicator (CSI) was applied to reveal individuals' preferred coping strategies during stressful situations and was administered to all participants. Firstly, the participants were requested to select and briefly describe a current (within the last 6 months) stressful event in their lives. Secondly, the participants read a list of 33 coping behaviours and then had to indicate the extent to which they use these responses to deal with the described event.

The CSI is based on research that identified three coping strategies that seemed to be the most natural reactions to stress. These included: problem solving (derived from direct management of stress, and also referring to the human fight tendencies), avoidance (a strategy compared with escape from stressors, also known as the flight reaction), and seeking support (which refers to the human need for contact during times of stress). Thus, the CSI consists of three subscales (i.e. problem focused coping, emotion focused coping, and social support) which are independent of one another and, according to Amirkhan (1990), should be free from demographic influences. Validity and reliability of this measure were established (Amirkhan, 1990). The internal consistency of subscales in this study was high for the problem solving subscale ($\alpha = 0.83$) and seeking social support subscale ($\alpha = .87$), and slightly lower for the avoidance-subscale ($\alpha = 0.63$). The chi-square test statistic divided by the degree of freedom was 1.59 which is less than the guideline value of 2. The Tucker-Lewis index was 0.78 and the RMSEA was 0.04 with a 90% confidence interval of [0.03; 0.04] which was lower than the guideline value of 0.06. These measures could be taken as an indication of a satisfactory fit.

The Mental Health Continuum-Short Form (MHC-SF) (Keyes, 2006)

The Mental Health Continuum-Short Form (MHC-SF) is a 14-item self report questionnaire that was administered to all the participants as a measurement of their levels of mental health. This includes subscales that measure their emotional well-being (satisfaction with life, absence of negative affect, and the presence of positive affect), psychological well-being (self-acceptance, personal growth, purpose in life, positive relations with others, environmental mastery, and autonomy), and social well-being (social integration, social contribution, social coherence, social actualization, and social acceptance).

The MHC-SF places an individual's mental health on a continuum from complete mental health (flourishing, filled with positive emotion, and optimal social and psychological functioning) to incomplete mental health (languishing, emptiness, and stagnation). According to Ryan and Deci

(2001), two perspectives can be applied to conceptualize well-being; namely, eudaimonic and hedonic well-being. Eudaimonic well-being is described as more than mere happiness and refers to self-realization and purpose in life. Hedonic well-being describes present happiness and pleasure (Van Rooy, 2007). The MHC-SF incorporates subscales that measure emotional well-being (hedonic well-being, items 1-3), social well-being (eudaimonic well-being, items 4-8), and personal well-being (eudaimonic well-being, items 9-14) (Keyes, 2002). The MHC-SF was recently validated within an African context by Keyes, Kruger, Potgieter, Temane, Van Rooy, and Wissing (2008) who found that the MHC-SF was a reliable measure in an African sample, yielding a Cronbach alpha of 0.74. In the current study, the MHC-SF also proved to be a reliable measure of well-being with a Cronbach alpha of 0.72. Further fit indices revealed the following: The chi-square test statistic divided by the degree of freedom was 1.63 which was less than the guideline value of 2. The Tucker-Lewis index was 0.88 and the RMSEA was 0.04 with a 90% confidence interval of [0; 0.05]. These measures can be taken as an indication of a satisfactory fit.

Procedure

This study is a crosscutter between the SABPA (Sympathetic Activity and Ambulatory Blood Pressure in Africans) and (Fortology: Biomarkers and psychological (ill-) health) projects, conducted within AUTHeR (Africa Unit for Transdisciplinary Health Research). Data was collected from 200 urbanized African teachers with the same socio-economic status. Recruitment was done by two of the researchers at schools in and around Potchefstroom in the North West Province, South Africa. Data collection was completed within a period of 50 working days to avoid the possible effects of seasonal change. During this period, data was gathered from a maximum of four participants per day. After completion of their day's work, participants were transported to the metabolic unit research facility of the North -West University, which is fully equipped for overnight visits and for the collection of biological data. During their stay at the unit, data gathering took place in well-ventilated rooms at a comfortable temperature.

The psychosocial test battery was administered shortly after the teachers' arrival at the metabolic unit. One part of the battery was completed before dinner and the last part was completed after dinner in order to avoid the effects of participant fatigue. The sequence in which the questionnaires were completed was also organized to lessen the effects of fatigue and drowsiness. Data was gathered by fieldworkers with postgraduate training in psychology and under the supervision of registered psychologists.

After completion of the total test battery, which took about 90 minutes, the participants spent the night at the metabolic unit and were woken up at 06:00 the next morning for certain physiological measurements to be taken. This phase of the data collection included self-report questionnaires which consisted of 'yes' or 'no' responses with regard to alcohol consumption and smoking status, a questionnaire on their general health status, and a biographic questionnaire. After the completion of this phase, participants had breakfast and were transported back to their schools. Feedback regarding the results of the tests were provided to the teachers within one week of testing.

Data analysis

Description of the sample according to gender, alcohol use, smoking, and body mass index (BMI) were calculated and are reported in categories. Descriptive statistics (M, SD, range, kurtosis, skewness) and Cronbach alpha reliability indexes for all the scales and their subscales were also calculated and appear in Table 1. These results serve as indicators of the stress levels (TSI), preferred coping styles (CSI), and level of mental health (MHC-SF) of the group as a whole. Cronbach alpha indices were used to determine the reliability of scales, whilst inter-item correlations provided a view of the internal constancy and consistency of the scale items (Smit, 1991). T-tests were conducted to compare the reported stress levels of subgroups that smoke and use alcohol with those that abstain from these activities. An ANOVA was also performed to explore the association between BMI and the stress levels reported by these participants (Field, 2009). As a final step, Structural Equation Modelling (SEM) was performed in order to determine the relationship that exists between teacher stress, coping behaviour, and well-being. SEM can be defined as a statistical technique for testing and estimating causal relationships between variables (Kline, 2005). It provides confirmatory data rather than explanatory data and is thus applicable and well suited to this research project as its function is to validate measurement models and to fit structural models. The AMOS statistical package was used to explore different models (Schumacker, & Lomax, 1996).

Ethical considerations

Ethical approval has been obtained from the Ethics Committee of the North-West University, Potchefstroom Campus (NWU-00036-07-S6; Approval date: 12 November 2007) (see Appendix A). Research was conducted in compliance with the protocol for human participants set out by the Declaration of Helsinki (World Medical Association, 2008). Participants were given participant numbers in order to conceal their identities and to ensure confidentiality. After being informed of all aspects of the research and given an opportunity to ask questions, consent forms were signed by all the participants for participation in both the physiological and psychological parts of the research. Psychologists or trained interns were present throughout the period of administration to answer questions and to ensure that the battery was completed correctly in a consistent environment.

RESULTS

Preliminary analysis

Descriptive statistics and reliability indices for the TSI, CSI, and MHC-SF are provided in Table 1. The Cronbach alpha reliability coefficients for the CSI subscales ranged between 0.87 (seeking social support) and 0.63 (avoidance). For the MHC-SF, these values ranged between 0.84 (personal well-being) and 0.79 (social well-being). As the subscales for the CSI measure different coping strategies, its total scale scores were not calculated. The subscales of the TSI, as originally proposed by Boyle et al. (1995), produced low alphas, and therefore only the total scale score of TSI was used as it yielded a Cronbach alpha reliability of 0.91. Together with the mean inter-item correlation of 0.33, this was taken as an indication of satisfactory internal consistency of the TSI as a measure of teacher stress in this context. According to the guidelines set by Nunally and Bernstein (1994), it can be deduced that the abovementioned measures produced results that lend themselves to further interpretation.

The total scale score of the TSI yielded a mean of 77.1 ($SD = 13.03$) for the group as a whole which is a possible indication of a high level of stress experienced by the teachers. This result seems to be in line with other Western literature confirming that teaching is a highly stressful occupation (Jackson & Rothmann, 2005; Kyriacou & Sutcliffe, 2001; Naring, Briet, & Brouwers, 2006; Vandeyar, 2005) and will be further contextualized in the discussion section.

The mean scores attained in each of the CSI subscales indicated that the highest subscale mean for the CSI was reported for problem solving (28.15), with a standard deviation of 4.09. According to criteria set by Amirkhan (1990), a mean of 26 indicates average use of this coping mechanism and anything above a mean of 31 points to a high probability that problem solving would be used as a coping mechanism. The subscale mean reported for seeking social support was 25.66, with a standard deviation of 5.00. For this subscale, a mean of 23 is indicative of average use of this coping mechanism. The lowest subscale mean of 21.07 was reported for avoidance, with a standard deviation of 3.78. A mean of 19 on the avoidance subscale is indicative of average use of this coping mechanism and a mean of 23 and above indicates high use of avoidance (Amirkhan 1990).

When evaluating these teachers' level of mental health as measured with the MHC-SF (Keyes et al., 2008), the mean score reported for the psychological/personal well-being subscale was 3.90, with a standard deviation of 0.83. The mean reported for the emotional well-being subscale was 3.38 with a standard deviation of 1.00. The social well-being subscale provided a mean of 3.00 with standard deviation of 1.06, indicating the degree to which these teachers evaluate themselves with regard to their social environment by using public and social criteria (Keyes, 2002). According to these results, 2% of this group of teachers were languishing, 70% were moderately mentally healthy, and 28% were flourishing. In a study by Keyes et al. (2008) that was conducted with Setswana speaking adults from both rural and urban areas in the North West Province, lower means of 3.30 (psychological/personal well-being), 2.60 (emotional well-being), and 2.40 (social well-being) were reported. This meant that a larger proportion (12.2%) of this sample was languishing, roughly the same percentage (67.8%) were moderately mentally healthy, and fewer individuals (20%) were flourishing (Keyes et al., 2008) than were the case in the current study. Although, from these results, it might seem as if the participants of this study had better mental health, results should be compared with caution, as these differences could be due to the fact that most participants in the current study have a higher mean socio-economic status than those involved in the study done by Keyes et al. (2008).

[Table 1]

In summary, it seems clear that this group of teachers are experiencing significant levels of stress. When comparing results regarding their coping behaviour with the guidelines set out by Amirkhan (1990) it is evident that they are coping with this stress by making above average use of all three of the coping strategies (PS, SSS, A) measured with the CSI. Furthermore, it appears that this group is

generally moderately mentally healthy, with almost a third of the individuals experiencing optimal mental health (i.e. flourishing), and only a small percentage reported to be in a state of incomplete mental health (i.e. languishing). The intercorrelations among the above mentioned constructs that would be included in path analyses are indicated in Table 2. Statistically significant positive intercorrelations were found between all of the subscales of the MHC-SF. Correlations between the various subscales of the CSI were also positive, except for the expected negative correlation between the avoidance subscale and the problem solving subscale. Intercorrelations between the different scales indicate that the problem solving coping strategy correlated positively with participants' psychological and social well-being scores on the MHC-SF ($p < 0.01$). The coping strategy of seeking social support also showed a significant positive correlation with the social well-being scale of the MHC-SF ($p < 0.05$). Avoidance as a coping strategy, however, showed a statistically significant ($p < 0.01$) negative correlation with the emotional well-being subscale of the MHC-SF. From the results in Table 2, it appears that the levels of stress reported by participants show no significant intercorrelation with the coping strategies as measured with the CSI, or the level of mental health of participants as reported on the MHC-SF.

[Table 2]

Correlations, t-tests, and ANOVA were performed to determine whether or not the demographic variables age and gender, as well as certain generally used, though often dysfunctional (Bjorntorp, 2001; Olivier & Venter, 2003) coping behaviours (i.e. smoking, alcohol use, and eating) were significantly related to the measures central to this study. This was done to determine the effect of these potential intervening variables on participants' functioning in order to establish the necessity to investigate more than one structural model when performing the SEM analysis.

Correlation results, indicated in Table 2, showed a small positive correlation between age and stress. Although this correlation was statistically significant ($p < 0.01$), it was of only small practical consequence ($r = 0.17$). Results regarding gender indicated that, on average, women made slightly more use of seeking social support ($m = 26.5$) than their male counterparts ($m = 24.9$) as indicated by the CSI. These results were, however, also only of small practical significance ($d = 0.29$). Results also indicated that, on average, females experienced more stress ($m = 79.7$) than males ($m = 74.5$) as measured with the TSI. This difference was of medium practical significance ($d = 0.4$).

With regard to different coping behaviours, results interestingly revealed that participants that smoked ($m = 73$) reported significantly less stress ($t = -1.9$, $p < 0.05$) on the TSI than non-smokers ($m = 78$). This difference was, however, only of small to medium practical significance ($d = 0.4$) and further investigation is needed. T-tests for alcohol use indicated that participants that made regular use of alcohol ($m = 72$) reported significantly less stress ($t = 3.4$, $p = 0.0007$) on the TSI than non-drinkers ($m = 79$). The differences between the reported stress levels of these groups were of medium practical significance ($d = 0.5$). In order to determine the association between participants' eating behaviour and their self-reported levels of stress, coping, and mental health, the total group was divided into three subgroups according to their BMI (results not shown). BMI, which is calculated by dividing body weight in kilograms by height in metres squared ($BMI = \text{kg/m}^2$) is considered a reliable indicator of obesity in adults (Bjorntorp, 2001). The three groups were classified according to the guidelines for the World Health Organization (WHO, 2008) as 'obese' (BMI of 30 kg/m^2 and above), 'overweight' (BMI of $\geq 25 \text{ kg/m}^2$), and 'normal' (BMI of 18.5 - 24.9 kg/m^2). After an ANOVA (Hurlbert, 2006) was performed on these subgroups, results revealed that, on average, obese individuals experienced more stress, as measured with the TSI, than the normal weight group. This result was of both statistical ($p = 0.04$) and of small to medium practical ($d = 0.4$) significance. Overweight individuals seemingly make more use of seeking social support as a coping strategy than obese individuals. This difference was of small to medium practical significance ($d = 0.4$). These results also revealed that normal weight individuals experience more emotional well-being than obese individuals as measured with the MHC-SF. This difference was also of small practical significance ($d = 0.3$).

In summary, it seems that the teachers who were using coping behaviours that are generally seen as dysfunctional and unhealthy, such as smoking and alcohol use, reported lower levels of stress than those who were not using these coping behaviours. Possible reasons for these results will be discussed in more detail in the next section.

In spite of the existence of differences between subgroups, these were found to be of only small to medium practical significance. Hence, it was thought appropriate to test one generic model for the group as a whole.

Structural Equation Modelling (SEM)

The main aim of this study was to examine the effect of coping behaviour on stress and the psychological well-being of school teachers in a South African context. Various structural models were evaluated with the use of SEM before deciding on one that represented a best fit to the data. Two specified paths were examined – a direct path representing the direct effect that the choice of a specific coping strategy could have on well-being, and an indirect path that represents the indirect effect that coping could have on well-being through its effect on teacher stress. After initial estimation of the full model, this model was then reduced to report only the significant paths (Figure 2). In this reduced model, the numbers on the paths represent the regression weights and the numbers between brackets are the standardized regression coefficients. Statistically meaningful paths are indicated with an asterisk. The results obtained from the reduced path model are shown in Figure 2. Following careful evaluation, it was decided that the model presented in Figure 2 was statistically and theoretically the best fit to the data. Fit indices from the SEM are shown in Table 3. They indicated that, although the Tucker-Lewis index for the chosen structural model was 0.69, which did not indicate a satisfactory fit, the chi-square test statistic divided by the degree of freedom was 1.63, which was less than the suggested guideline of 2, and the RMSEA was 0.04, with 90% confidence interval of [0.37; 0.42], which was lower than the guideline value of 0.06. These last two measures of fit could be taken as an indication of a satisfactory fit.

[Table 3]

Results elucidating the direct effect that coping behaviour could have on well-being were the following: Regression weights revealed that using avoidance as a coping strategy had a direct and statistically significant negative influence on the emotional well-being of this group of teachers ($\beta = -.30$). Problem solving had a direct and significant positive influence on both social well-being ($\beta = .23$) and personal/psychological well-being ($\beta = .31$). Although this result fell just below the threshold for statistical significance, it can be mentioned that seeking social support had a direct and positive influence on the level of social well-being ($\beta = .15$) reported by participants.

Results regarding the possible existence of an indirect path that represents the indirect effect that coping could have on well-being through its effect on teacher stress interestingly showed that the adoption of a problem solving approach to coping had a direct positive effect on the amount of teacher stress ($\beta = .16$). These results were unexpected seeing that problem solving is generally

thought to have a lowering effect on stress. Further results showed that avoidance as a coping mechanism also had a direct positive effect on teacher stress ($\beta = .17$). These results were, however, not statistically significant. Importantly, the results indicated that there was no relationship between stress and well-being. Possible explanations for these results will be provided in the discussion section.

[Figure 2]

DISCUSSION

The aim of this study was to examine the effect of coping behaviour on stress and the psychological well-being of African teachers. Reliability indices for all the scales and subscales indicated that the measures that were used were all reliable and thus interpretable. The only exception was the subscale scores for the TSI which did not produce acceptable Cronbach alpha indices. It was, therefore decided that only the total scale score would be used during interpretation. A confirmatory factor analysis was performed for all the measures and revealed that all the fit indices were satisfactory.

Mean scores for the TSI indicated that the group as a whole was experiencing high levels of stress. This was comparable to the results of Olivier and Venter (2003) who reported that most of the 132 secondary school teachers from the George area that were involved in their study reported high levels of emotional stress. Almost a third (33.1%) of these teachers reported that they experience their job as a major stressor in their lives. Of these teachers, 67% reported that they experienced physical and behavioural manifestations of stress. Another study done in the former Transkei involving black secondary school teachers reported that 91.3% of teachers also reported significant levels of stress (Mwamwenda et al., 1997). In a study done in the United States of America regarding teacher stress and burnout results obtained with the Fimian TSI also revealed high levels of stress. The Fimian TSI produced a total mean of 55.05 that, although substantially lower than the total score in the present study, was interpreted as indicative of significant stress (Colangelo, 2004). The inference is thus made that the teachers who participated in this study are experiencing substantial levels of stress.

Results regarding these teachers' coping behaviour indicated that this group copes with their stress by making above average use of all three of the coping strategies that were measured, i.e. problem solving, seeking social support and avoidance. This result can perhaps also be interpreted as confirming the high levels of stress experienced by these teachers. In addition, these high scores might also be a consequence of the self report format that was used during the research as the teachers could have tried to answer in a socially acceptable way. In an article by Utsey, Adams and Bolden (2000), problem solving (i.e. problem focused coping) is argued to represent a healthy way of coping with problems in a Western culture. According to these authors, individuals from a predominantly Western background tend to direct their energy towards the regulation and managing of stressful events. African cultures, on the other hand, are seen as collectivistic and spiritual based, and thus tend to place more emphasis on seeking support from their community and friends and connecting with nature (Utsey et al., 2000). Interestingly, results from the current study indicated that the participants, although from an African background, are just as involved in problem solving as they are in seeking social support when dealing with their stressors. This might indicate the degree of Westernization of this group, and the concomitant implementation of traditionally Western coping mechanisms by this group of teachers.

With regarding to these teachers' sense of well-being, it appears that most of them (70%) are moderately mentally healthy, meaning that they are experiencing substantially better mental health than the few individuals who were found to be languishing (2%). Only 28% of these teachers were found to be flourishing, meaning that they are experiencing a sense of psychological well-being characterized by being filled with positive emotion and functioning optimally on a social and psychological level with high resilience and low helplessness (Keyes, 2007). Compared to a study done by Keyes (2002) in the United States of America, where it was found that 26% of the participants were languishing, 57% were moderately mentally healthy and 17% were flourishing, it appears that the percentages for the Western cultures differ from those of the African cultures. Western populations seemingly experience higher levels of languishing and much lower levels of flourishing. Keeping in mind the collectivistic nature of the African culture, these results are not surprising. Research that was done in the United States of America by Ryff, Keyes, and Hughes (2003) reported that, when evaluating the racial ethnic differences with regard to the psychological well-being subscales, black individuals in general reported higher levels of well-being than Westernized individuals on all of the subscales. More research is, however, needed in this regard to confirm that the same trend exists in an African context.

Before any further analysis of the association between the different measures could be undertaken, it was important to ascertain whether or not the above results could be taken as a representation of the functioning of the entire group. T-tests and an ANOVA indicated that, although the mean levels of stress reported by individuals who smoked and used alcohol were lower than those who abstained from using these substances, these differences were only of small to medium practical significance. Results regarding intra-group differences related to gender, age, BMI, and well-being also revealed differences with only small to medium practical significance, and it was thus possible to proceed with correlational and path analysis. These findings, however, warrant further investigation regarding the impact of smoking, alcohol use, and obesity on stress, as well as the influence of age and gender on coping behaviour.

Correlation analysis revealed that stress had no significant correlation with either coping or well-being. According to these results, the amount of stress that the teachers are experiencing has no significant association with either their well-being or their choice of coping strategies. A number of positive correlations were, however, found between coping strategies employed by participants and certain aspects of their mental health. More specifically, the use of problem solving as a coping strategy correlated positively with both social and psychological well-being, indicating that the more the teachers make use of problem solving, the higher their experience of social and psychological well-being, or vice versa. Expectedly, the more these teachers use problem solving as a coping strategy, the less they tend to avoid their stressors. Avoidance, however, seems to have a negative correlation to emotional well-being, thus the more that teachers make use of avoidance as a coping behaviour, the less they experience feelings of emotional well-being. The negative effect of long term use of avoidance as a coping behaviour on psychological well-being has been confirmed in literature (Fiocco, & Anisman, 2007; Markstrom, Marshall & Tryon, 2000; Matheson, Skomorovsky, Moos & Holahan, 2003). Although these correlations provide some insight into the relationship between some of the constructs central to this study, they do not serve as adequate evidence for the possible influences that these constructs exert on each other. A path analysis would provide a clearer picture regarding the causal nature of these relationships.

Results obtained through SEM provided evidence that coping (avoidance, seeking social support, and problem solving) has an effect on well-being. Results revealed a strong negative path between avoidance as a coping behaviour and emotional well-being. This can be interpreted as a significant relationship between emotional well-being and avoidance, meaning that the use of avoidance as a coping strategy has a direct and negative influence on these teachers' experience of satisfaction with

life, absence of negative affect, and the presence of positive affect. This confirms the results reported by Matheson et al. (2007) which revealed that, although avoidance could be effective in giving immediate relief of an ongoing stressor, in the long run, it has a negative influence on a person's well-being. A direct path was also reported between seeking social support and social well-being. This suggests that teachers' use of seeking social support as a coping strategy enhances their experience of social integration, social coherence, and social acceptance. As stated by Post and Weddington (1997), social support is an important part of the collectivistic consciousness in African cultures. Our results confirmed that teachers experience an enhanced sense of social well-being when they made use of seeking social support as a coping strategy.

Results also revealed that problem solving had a significant positive influence on both the social well-being and psychological well-being of participants. Adopting a problem solving approach to coping thus has a positive effect on the teachers' experience of self acceptance, personal growth, purpose in life, and autonomy as well as feelings of social integration, social contribution, and social acceptance. In a study done by Smith (2003), it was found that higher levels of well-being are generally positively related to problem solving. The reason for this, according to Martin and Dahlen (2005), is that problem solving helps to maintain and enhance a more positive outlook on life and generates a feeling of being in control. With regard to the positive effects of problem solving on social well-being, it could be argued that when these teachers are experiencing better psychological well-being, they are more inclined to partake in social activities that would contribute to their social well-being. Interestingly, results of this study also alluded to the existence of a direct path and positive relationship between problem solving and the amount of stress that these teachers experience. This finding is in contrast with what has previously been found in Western cultures (Martin & Dahlen, 2005). Recent studies done by Malan, Malan, Wissing, and Seedaat (2008), however, produced similar results regarding the use of problem focused coping by Africans. In their study on the relationship between coping and metabolic syndrome (hypertension prevalence, glucose, and fibrinogen) in Africans, they found that the adoption of an active coping style (i.e. problem solving) led to higher values in a number of metabolic syndrome indicators. These Africans were thus experiencing lower levels of physiological health, specifically related to the experience of excessive stress. A follow-up study could be conducted in future which could triangulate the current data with findings from physiology to give a better explanation for the current findings. Coping research done by Sideridis (2006) emphasized that problem solving as a coping method has an adaptive and effective influence in dealing with stressors, and Moos and Holahan (2003) stated that problem solving can help to moderate the adverse effects that role

stressors have on psychological functioning. A large body of literature, however, states that only if problem solving is a realistic option would it aid in adaptive functioning (Thoits, 1995). There are clearly different opinions regarding the effectiveness of using problem solving as a coping response, and indeed it seemed from this study that the adoption of a problem solving approach led to an increase in the stress experienced by this group of African teachers. This finding could be attributed to the self report format of the measures. It could also be argued that, when actively using problem solving, these teachers are continuously aware of their stressors and the reality thereof, thus increasing their stress regarding the problems that they experience.

According to African philosophy, everything in the universe is connected (Utsey et al., 2000) and individuals can be seen as an extension of their environment. The resulting collective consciousness, where emphasis is placed on group cohesion and social support, leads to the importance of the group as a support system (Utsey et al., 2000). In the current study, the importance of this collectivistic stance is confirmed by the results. When using social support as a coping strategy, these teachers experience more social well-being than would be expected. The finding that there were no significant direct relationships between the amounts of stress that these teachers experienced and their mental health warrants further attention. The structural model seems to suggest that the way in which stressors are approached by these teachers (i.e. their chosen coping strategies) are more important determinants of their well-being than the amount of stress that they experience.

Utsey et al. (2000) stated that coping in the African context can be seen as the maintenance of a balance between spirituality and physical well-being. It is when this delicate balance is upset that stress and illness occur. With this in mind, we could commence research regarding the impact of spiritual coping mechanisms on the well-being of individuals in an African context (which our current instruments did not allow). This emic approach will allow for the identification of coping mechanisms that are effective in the maintenance and improvement of well-being within a specific cultural setting. For this group of teachers, it seems that making use of social support, which is seen as characteristic of their collectivistic background, could have a positive effect on their well-being. Although the adoption of a problem solving approach increased their stress levels it still has a positive effect on both their social well-being and personal well-being. Future research regarding this matter, and the changes that are brought about by the rapid rate of urbanization, is needed to illuminate which coping strategies would be best for African teachers in an urban context.

CONCLUSION

It is evident that the teachers involved in this study are experiencing high levels of stress. In spite of this, most of them are moderately mentally healthy and appear to be making above average use of all three of the measured coping strategies. The results indicated that the coping strategies that these teachers used had little effect on the amount of stress that they experienced. Their coping strategies did, however, have a significant effect on all the aspects of their mental health. Thus, it could be that it is not the amount of stress that primarily influences the mental health of this group, but the way in which they cope with it.

Shortcomings of the current study and suggestions for future research

During the discussion of the results obtained from this study, a few shortcomings and important avenues for further research came to the fore. These weaknesses and suggestions are discussed below:

1. A prominent limitation of this study was the fact that the TSI had not previously been validated in the current context, which resulted in the use of only a total scale score. Future validation of this scale and its subscales will allow the impact of different sources of stress to be determined.
2. As the measurements for the study consisted exclusively of self report questionnaires, the way in which the participants responded could have had an influence on the results. The possibility also exists that they were answering what they thought the researchers wanted to hear. This could be a possible explanation of the high scores obtained on nearly all the measures.
3. The results revealed that these African teachers experienced more stress when they used problem solving as a coping mechanism. Subjects in Western cultures, however, seem to lessen their stress levels by using problem solving as a coping behaviour. Future research regarding the possible reasons for this could shed some light on the differences between coping in African and Western cultures.
4. Demographic statistics indicated that this group of participants consisted of different ages and genders, and that they were mainly urban African participants. These demographics (age, gender, and culture) could have an influence on the dynamics between stress, coping, and well-

being. These effects should be investigated further in future studies. With regard to culture, future research could focus on cross-cultural as well as intra-cultural comparison in order to elucidate the differences regarding stress, coping, and well-being within groups and between groups.

5. Because of the high stress levels reported by teachers, there is a possibility that there is not enough variation in the data to detect existing relationships between stress and mental health. Future studies should also include subjects from lower stress occupations.

References

- Amirkhan, J. H. (1990). A factor analytically derived measure of coping: The coping strategy indicator. *Journal of Personality and Social Psychology*, *59*(5), 1066-1074.
- Bach, M. (2000). Stress, coping, social support and psychological and physical well-being in a group of academics. Dissertation submitted in partial fulfilment of the requirements for the degree Magister Artium (Clinical Psychology) at the North-West University, Potchefstroom Campus.
- Bjorntorp, P. (2001). *International textbook of obesity*. New York: John Wiley
- Boyle, G. J., Borg, M. G., Falzon, J. M., & Baglioni, A. J. (1995). A Structural model of the dimensions of teacher stress. *The British Journal of Educational Psychology*: *65*(1), 29-67.
- Brown, S. P., Westbrook, R. A., & Challagalla, G. (2005). Good cope, Bad cope: Adaptive and maladaptive coping strategies following a critical negative work event. *Journal of Applied Psychology*, *90*(4), 792-298.
- Colangelo, M. T. (2004). Teacher stress and burnout and the role of Physical Activity and Parent Involvement. *A thesis submitted in partial fulfillment of the requirements for the Degree of Masters of Arts in Psychology*. Department of Psychology, Central Connecticut State University New Britain, Connecticut Department of Psychology.
- De Kooker, M. (2008). Mind, immunity and health: The science and clinical application of psychoneuroimmunology. *Continuing Medical Education*, *26*(1), 18-20.
- Field, A. (2009). *Discovering statistics using SPSS*. SAGE: London.
- Folkman, S., & Moskowitz, J. T. (2004). Coping: Pitfalls and promise. *Annual Review of Psychology*, *55*, 74-745.
- Folkman, S. & Moskowitz, J. T. (2000). Stress, positive emotion and coping. *Current directions in psychological science*, *9*, 115-118. Reprinted in *The Western Psychologist*, October, 2000.

Guidelines for the management of Arterial Hypertension (2007). *Journal of Hypertension*, 25, 1105–1187.

Hurlbert, R. T. (2006). *Comprehending behavioural statistics* (4th ed.). USA.

Jackson, L., & Rothman, S. (2005). Work related well-being of educators in a district of the North-West Province. *Perspective in Education*, 23(3), 107-122.

Keyes, C. L. M. (2002). The Mental Health Continuum: From languishing to flourishing in life. *Journal of Health and Social Research*, 43, 207-222.

Keyes, C. L. M. (2006). If health matters: when will we stop saying one thing and doing another? Keynote address presented at the South African Conference on Positive Psychology: Individual, social and work wellness. Potchefstroom, South Africa.

Keyes, C. L. M. (2007). Promoting and protecting mental health as flourishing: A Complimentary strategy for improving national mental health. *American Psychologist*, 62(2), 95-108.

Keyes, C. L. M., Kruger, M., Potgieter, J. C., Temane, M., Van Rooy, A., & Wissing M. (2008). Evaluation of the mental health continuum-short form (MHC-SF) in Setswana speaking South Africans. *Journal of Clinical Psychology and Psychotherapy*, 15(3), 1811.

Kline, R. B. (2005). Equation modelling: Principles and practice of structural equation modelling. Retrieved July 6, 2009, from www.guilford.com/pr/kline.htm

Kokkinos, C. M. (2007). Job stressors, personality and burnout in primary school teachers. *British Journal of Educational Psychology*, 77, 299-243.

Kyriacou, C., & Sutcliffe, J. (1978b). Teacher stress: Prevalence, Sources and Symptoms. *British Journal of Educational Psychology*, 48, 159–167.

Kyriacou, C. (2001). Teacher stress: Directions for future research. *Educational Review*, 53(1), University of York: UK.

- Lazarus, R. S., & Folkman, S. (1984). *Stress, appraisal, and coping*. New York: Springer.
- Litman, J. A. (2006). The Cope Inventory: Dimensionality and relationships with approach- and avoidance motives and positive and negative traits. *Personality and Individual Differences, 41*, 273-284.
- Malan, L., Malan, N. T., Wissing, M. P., & Seedat, Y. K. (2008). Coping with urbanization: A cardiometabolic risk? *Biological Psychology, 79*, 323-328.
- Martin, R. C., & Dahlen, E. R. (2005). Cognitive emotion regulation in the prediction of depression, anxiety, stress and anger. *Personality and Individual Differences, 39*, 1249-1260.
- Markstrom, C. A., Marshall, S. K., & Tryon R. J. (2000). Resiliency, social support, and coping in rural low-income Appalachian adolescents from two racial groups. *Journal of Adolescence, 23*, 693-703.
- Matheson, K., Skomorovsky, A., Fiocco A., & Anisman, H. (2007). The limits of 'adaptive' coping: Well-being and mood reactions to stressors among women in abusive dating relationships. *Stress, 10*(1), 75-91.
- Mearns, J., & Cain, J. E. (2003). Relationship between teachers' occupational stress and their burnout and distress: Roles of coping and negative mood regulation expectancies. *Anxiety, Stress and Coping, 16*(1), 71-82.
- Moos, R. H., & Holahan C. J. (2003). Dispositional and contextual perspectives on coping: Toward an integrative Framework. *Journal of Clinical Psychology, 59*, 1387-1403.
- Mwamwenda, T. S., Monyooe, L. A., & Glencross, M. J. (1997). Stress of secondary school teachers in Transkei, South Africa. *Psychological Reports, 80*, 379-382.
- Naring, G., Briet, M., & Brouwers, A. (2006). Beyond demand and control: Emotional labour and symptoms of burnout in teachers. *Work and stress, 20*(4), 303-315.

- Ngidi, P. D., & Sibaya, P. T. (2002). Black teachers personality dimensions and work related stress factors. *South African Journal of Psychology*, 32(3), 7-15.
- Nunnally, J. C., & Bernstein, I. H. (1994). *Psychometric theory* (3rd ed.). New York: McGraw-Hill.
- Olivier, M. A. J., & Venter D. J. L. (2003). The extent and causes of stress in teachers in the George region. *South African Journal of Education*, 23(3), 168-192.
- Post, D. M., & Weddington, W. (1997). The impact of culture on physician stress and coping. *Journal of the National Medical Association*, 89, 585-590.
- Ryan, R. M., & Deci, E. L. (2001). On happiness and human potential” A review of research on hedonic and eudaimonic well-being. *Annual Review of Psychology*, 52, 141-166.
- Ryff, C. D., Keyes, C. L. M., & Hughes, D. (2003). Status inequalities, perceived discrimination, and eudaimonic well-being: Do the challenges of minority life hone purpose and growth? *Journal of Health and Social Behavior*, 44, 275–291.
- Schumacker, R. E., & Lomax R. G. (1996). *A beginner's guide to structural equation modeling*: Lawrence Erlbaum Associates.
- Sideridis, G. D. (2006). Coping is not an ‘either’ ‘or’: The interaction of coping strategies in regulating affect arousal and performance. *Stress and Health*, 22, 315-327.
- Smit, G. J. (1991). *Psigometrika*. Bloemfontein: HAUM.
- Smith, D. C. (2003). Problem solving as an element of development well-being. In B. H. Bornstein & L. Davidson (Eds.), *Well-being: Positive development across the life course* (pp. 312–330). Mahwah, NJ: Lawrence Erlbaum.
- Thoits, P. A., (1995). Stress, coping, and social support processes: Where are we? What next? *Journal of Health and Social Behavior*, 35, 53-79.

Utsey, S. O., Adams, E. P., & Bolden, M. (2000). Development and validation of the Africultural Coping Systems Inventory. *Journal of Black Psychology, 26*(2), 194-215.

Valle, M. F., Heubner, E. S., & Saldo, S. M. (2006). *An analysis of hope as a psychological strength*. Department of Psychology, University of South Carolina, Columbia, United States.

Van Dick, R., & Wagner, U. (2001). Stress and strain in teaching: A structural equation approach. *British Journal of Educational Psychology, 71*, 243-259.

Van Rooy, S. G. (2007). Validation of a scale to measure psychosocial well-being in an African context. Unpublished dissertation. University of the North West, Potchefstroom.

Van Zyl, E., & Peterson, C. (1999). An investigation into the work stress experienced by a group of secondary school teachers. *South African Journal of Psychology, 19*, 74-78.

Vandeyar, S. (2005). Conflicting demands: Assessment practices in three South African primary schools undergoing desegregation. *The Ontario Institute for Studies in Education of the University of Toronto. Curriculum Inquiry, 35*(4), 461-481.

World Health Organization. Body Mass Index. Retrieved October 11, 2009, from http://www.euro.who.int/nutrition/20030507_1.

World Medical Association, Ethics Unit. Declaration of Helsinki, 2008. Retrieved October 9, 2009, from www.wma.net/e/ethicsunit/helsinki.htm.

Yong, Z., & Yue, Y. (2007). Causes for burnout among secondary and elementary school teachers and preventative strategies. *Chinese Education and Society, 40*(5), 78-87.

TABLES

Table 1. Descriptive statistics and reliability indices for the MHC-SF, TSI, and the CSI of black African teachers

Scales	M	SD	Min	Max	Kurt	Skew	α
CSI-PS	28.15	4.09	15	33	0.14	-0.88	0.83
CSI-SSS	25.66	5.01	11	33	0.37	-0.74	0.87
CSI-A	21.07	3.78	11	31	0.11	-0.01	0.63
MHC-SF-EWB	3.38*	1.00	0	15	0.40	-0.85	0.83
MHC-SF-SWB	3.00*	1.06	0	25	0.47	-0.29	0.79
MHC-SF-PWB	3.90*	0.83	6	30	0.44	-0.89	0.84
MHC-SF-TOT	48.29	10.94	11	70	-0.44	-0.18	0.72
TSI-TOT	77.1	13.03	47	100	-0.61	-0.28	0.91

Note: N = 200, M = mean, SD = standard deviation, MIN = minimum values, MAX = maximum values, KUR = kurtosis, skew = skewness, α = Cronbach's Alpha, CSI-PS = Coping Strategy Indicator Problem Solving subscale, CSI-SSS = Coping Strategy Indicator Seeking Social Support subscale, CSI-A = Coping Strategy Indicator Avoidance subscale, MHC-SF-EWB = Mental Health Continuum-Short Form Emotional Well-Being subscale, MHC-SF-SWB = Mental Health Continuum-Short Form Social Well-Being subscale, MHC-SF-PWB = Mental Health Continuum-Short Form Psychological Well-Being subscale, MHC-SF-TOT = Mental Health Continuum-Short Form Total Scale Score, TSI-TOT = Teacher Stress Inventory total scale score, * = Means per item (mean score for subscales divided by amount of items per subscale)

Table 2. Pearson correlations between scales and subscales of black African teachers

	MHC- SF EWB	MHC- SF SWB	MHC- SF PWB	TSI- TOT	CSI- PS	CSI- A	CSI- SSS	AGE
MHC- SF EWB	1.000							.01
MHC- SF SWB	.41**	1.000						.05
MHC- SF PWB	.49**	.55**	1.000					.03
TSI- TOT	.00	.03	.018	1.000				.17*
CSI- PS	.13	.20**	.24**	.12	1.000			-.04
CSI- A	-.23**	-.06	-.08	.12	-.16*	1.000		-.02
CSI- SSS	-.09	.14*	.07	.13	.16*	.05	1.000	.09

Note: CSI-PS = Coping Strategy Indicator Problem Solving, CSI-SSS = Coping Strategy Indicator Seeking Social Support, CSI-A = Coping Strategy Indicator Avoidance, MHC-SF-EWB = Mental Health Continuum-Short Form Emotional Well-being, MHC-SF-SWB = Mental Health Continuum-Short Form Social Well-being, MHC-SF-PWB = Mental Health Continuum-Short Form Psychological Well-being, MHC-SF-TOT = Mental Health Continuum-Short Form Total scale score, TSI-TOT = Teacher Stress Inventory total scale score, ** Correlation is significant at the 0.01 level (2 tailed), * Correlation is significant at the 0.05 level (2 tailed)

Table 3. Goodness of fit indices for structural model

Model	CMIN	DF	X²/DF	IFI	TLI	CFI	RMSEA
2	3489.18	2138	1.63	0.72	0.69	0.71	0.37 ; 0.42

GFI = Goodness of Fit Index, RMSEA = Root Mean Square Error of Approximation, CMIN = Minimum Sample Discrepancy, DF = Degrees of Freedom, IFI = Incremental Fit Index, TLI = Tucker-Lewis Index, CFI = Comparative Fit Index

FIGURES

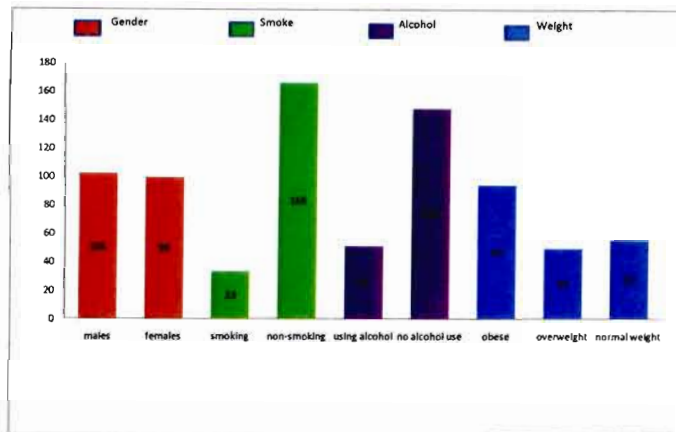


Figure 1. Descriptive statistics for participants

Classification of BMI: Obese = 30 kg/m^2 and above, overweight = $\geq 25 \text{ kg/m}^2$, and normal = $18.5\text{-}24.9 \text{ kg/m}^2$.

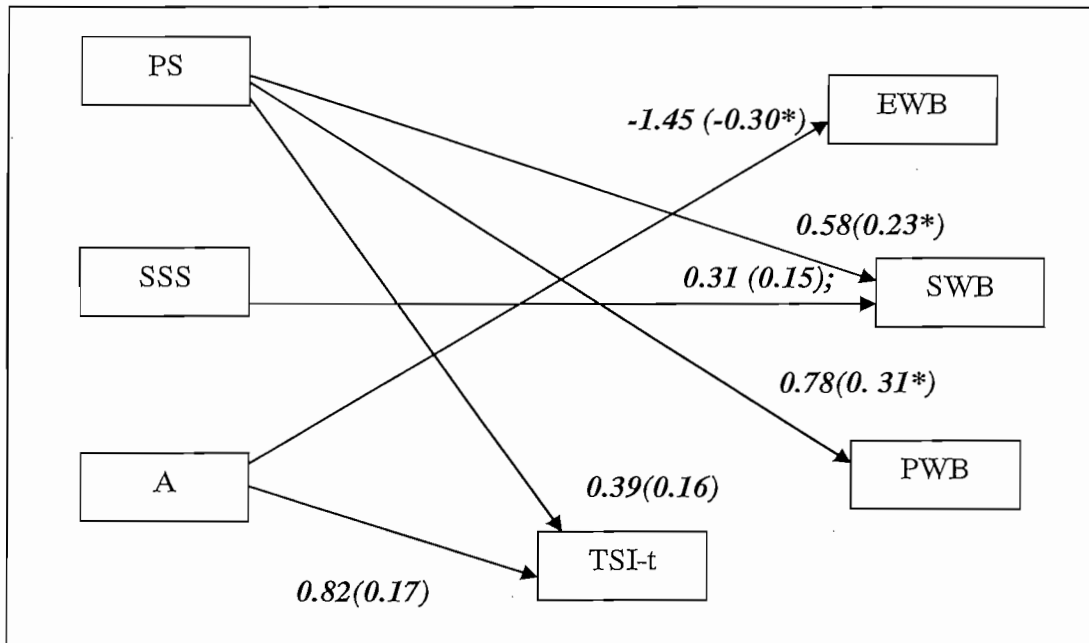


Figure 2. Reduced model relating well-being, coping, and stress in black African teachers

Note: CSI-PS = Coping Strategy Indicator Problem Solving, CSI-SSS = Coping Strategy Indicator Seeking Social Support, CSI-A = Coping Strategy Indicator Avoidance. MHC-EWB = Mental Health Continuum-Short Form Emotional Well-being, MHC-SWB = Mental Health Continuum-Short Form Social Well-being, MHC-PWB = Mental Health Continuum-Short Form Psychological Well-being. TSI-TOT = Teacher Stress Inventory total scale score, * = statistically significant

The numbers on the paths represent the regression weights, and the numbers between brackets are the standardized regression coefficients.