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JOB STRESS, JOB DISSATISFACTION AND STRESS RELATED ILLNESSES AMONG SOUTH AFRICAN EDUCATORS

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Abstract

The aim of this study was to explore the relationship between self-reported job stress and job dissatisfaction and the prevalence of stress related illnesses and risk factors amongst educators. A cross-sectional survey was conducted in a representative sample of 21,307 educators from public schools in South Africa. Self-reported measures of job stress, job satisfaction, and stress-related illnesses (including mental distress) were taken. HIV-antibody tests (ELIZA) and CD-4 count was taken from those educators who agreed to blood specimens. Results indicate that the prevalence of stress-related illnesses were 15.6% for hypertension, 9.1% stomach ulcer, 4.5% diabetes, 3.9% major mental distress, 3.8% minor mental distress, and 3.5% asthma. The study found considerably high stress levels among educators. Job stress was weakly associated with seven out of ten stress related illnesses but none was significant considering effect size calculations. Stress from teaching methods seemed to have higher impact on stress related illnesses than other components of the job stress scale. From three components of the demand-control model two, namely work stress from teaching methods and the educational system, but not low peer support was related to heart disease. The components of the effort-reward model of low socio-economic status and lack of career advancement were both not related to heart disease and only lack of career advancement was inversely related to hypertension. Most components assessed here of the demand-control model (including stress with teaching methods and educational system, low peer support) and effort-reward model (including job insecurity and lack of career advancement) were related to stomach ulcer and mental distress. It is recommended that changes to the organization of work with particular attention being paid to increasing control and reward conditions be implemented and stress management may be included in work health programmes for educators.

Key words: *Job stress; job dissatisfaction; risk behaviours; stress-related illnesses; public educators; South Africa*

Although a fair amount of stress is needed to stimulate individuals to overcome challenges, extreme or persistent stress can be detrimental to the person's physical and mental health (Giga, Cooper & Faragher, 2003; Hobfoll, 1988). Prolonged job stress may lead to emotional exhaustion, feelings of lack of personal accomplishment, depersonalization (feeling detached from learners) and eventual burnout (Cilliers, 2003). The effects of (dis)stress on physical health are well documented (Moch, 1999). According to the general adaptation syndrome (GAS) theory the body experiences three stages of reaction (alarm, resistance and collapse) in response to prolonged exposure to stressful situations. The body goes from physiological *preparation* (increasing blood pressure, metabolism (heartbeat and breathing), the production of blood sugar, cholesterol, fatty acids and stomach acids, faster blood clotting, localised inflammation and decreasing protein synthesis, digestion and immune and allergic response systems) to *adaptation* (trying to maintain equilibrium) to *exhaustion* (where it can no longer resist stress anymore). Collapse, the final stage, occurs when alarm reactions are too intense or occur too frequently over an extended period.

The National Institute on Occupational Safety and Health (1998) linked stress with physiological conditions such as cardiovascular diseases, stroke, increased susceptibility to infections, gastrointestinal tract problems, stomach ulcer, diabetes, sleeping disorders, asthma, immune system disease, concentration problems, depression as well as general increases in blood pressure and cholesterol levels. It has been suggested that 80 per cent of all modern diseases have their origins in stress. In the UK, 40 million working days per year are lost directly from stress - related illness (Jordan, Gurr, Tinline, Giga, Faragher & Cooper, 2003).

Research over the last 15 years has shown that some stressors are simply worse than others (Schnall & Landsbergis, 1994). Two "models" of such stressors and their effects on health and safety are of particular importance (Muntaner & O'Campo (1993). These are: 1. The Demand/Control Model (Karasek & Theorell, 1990) and 2. The Effort/Reward Imbalance Model (Siegrist, 1996). The common factor in the two models of how stress affects health is the identification of certain workplace conditions as key players in the production of stress. These conditions arise largely from decisions that are made about how work should be organized.

Demand/Control Model:

- High Job Pressure: having too much to do over too long a period with constant imposed deadlines.
- Low Job Control: having too little influence over the day-to-day organization of your own work.
- Home Stress: the sum of cumulative demands, challenges and changes experienced on the home front.
- Social Support: having at least one person who can be relied on for emotional support during times of distress or unhappiness.

This model shows that high pressure plus low control contribute to strain, particularly when combined with home stress and the absence of social support (adapted from Karasek & Theorell, 1990)

Effort/Reward Imbalance Model:

Effort: mental or physical energy expended to achieve organizational goal.

Reward: compensation for or acknowledgement of effort in terms of bestowed status, financial gain or career advancement.

This model shows that high effort/low reward conditions are associated with a variety of adverse health outcomes prominent among which are cardiovascular disease and mental health problems such as anxiety and depression (Siegrist, 1996). An advantage of Siegrist's model is that it expands the concept of control typically used in research on Karasek's job demands-control model to include job security and upward mobility (promotion prospects).

Jobs or organizational roles, which are associated with overload, excessive demands and many responsibilities cause job strain, and this has been shown to lead to a high risk of adverse health outcomes, such as cardiovascular diseases (Kang, Koh, Cha, Park & Baik, 2005). Karasek's job strain model has been used in a study amongst British civil servants to explain why employees in jobs with concurrent low decision latitude and high job demands showed high

risk for coronary heart disease (Kuper & Marmot, 2003). According to this model, the combination of high work demand with low decision latitude at work resulted in job strain. A study among male employees showed that participants who reported effort-reward imbalance were at higher risk of coronary conditions associated with hypertension and high cholesterol (Peter, Alfredsson, Hammar, Siegrist & Theorell, 2002).

However, a similar study amongst women found that neither job control nor Karasek's demand-control model could explain increased risk of coronary heart disease among women in the lowest occupational classes (Wamala, Mittleman, Horsten, Schenck-Gustafsson & Orth-Gomer, 2000). This finding suggests that with women there may be a complex interaction between sources of work and non-work stress that mediate behavioural and biological factors that increase risk of coronary heart disease. Yao *et al.* (2003) found in a study among four occupational groups in China that blood pressures were higher in the groups of old age and teachers, and the abnormal rate of blood pressure was 21.7%. Ducher, Cerutti, Chatellier and Fauvel (2006) study results suggest that there is no global relationship between job strain and blood pressure (BP) levels. However, they found a significant association between job strain and work site BP in a predominantly male subgroup of newly diagnosed hypertensive subjects exposed to high job strain. Among these white-collar workers, exposure to cumulative job strain had a modest but significant effect on systolic blood pressure among men. The risk was of comparable magnitude to that observed for age and sedentary behaviour. Men and women with low levels of social support at work appeared to be at higher risk for increases in blood pressure (Guimont *et al.*, 2006).

In a Japanese study in men, the level of job strain (the ratio of psychological job demands to job control) correlated with the prevalence of hypertension. In a multiple logistic regression model, job strain was significantly related to hypertension, after adjustment for age, employment (white collar vs. blue collar), marital status, family history of hypertension, cigarette smoking, alcohol intake, physical activity, and body mass index. The stratified analyses showed significant excess risks in the subordinate groups compared with managers, blue collar workers, less educated workers, and the older age groups. This association was not significant in women (Tsutsumi *et al.*, 2001). Kang *et al.* (2005) found that decision latitude was associated with cholesterol, triglyceride, and homocystein and that work demand was related to smoking and systolic blood pressure. Job strain (the combination of high work demand with low

decision latitude) was significantly related to higher levels of homocystein after controlling for age, BMI, smoking, and social support at workplace.

Several recent studies have highlighted the links between work-related stress, violence at work, the abuse of drugs and alcohol and tobacco consumption. These studies tend to suggest that stress at work plays an important role in the development of negative individual and organizational factors and forms a common element linking working conditions, substance abuse and violent acts. There appears to be a significant correlation between difficulties in relaxing after work and negative emotions such as fear, helplessness and failure. Stressful work may contribute to the development of a desire among workers to reduce tension by drinking, using drugs and other harmful substances. Further, stratified analyses suggest an effect-measure modification of perceived job stress in the relationship between peptic ulcers and smoking. Multiplicative and additive models suggest positive interaction between perceived job stress and smoking (Shigemi, Mino & Tsuda, 1999). Dawson, Grant and Ruan (2005) found that there was a consistent positive relationship between number of past-year stressors experienced and all measures of heavy drinking. Job-related and legal sources of stress were more strongly associated with alcohol consumption than were social and health-related stress. Men showed a stronger association than women between the number of stressors and the most consumption measures; they also responded more strongly to the presence of any legal and job-related stress. Having an income below the poverty level intensified the effects of job-related stress, but having a mood or anxiety disorder did not affect any of the associations between stress and consumption.

Cooper and Kelly (1993) assessed occupational stress amongst 2,638 head teachers of primary and secondary schools, together with principals/directors of further and higher education establishments, throughout the United Kingdom. Data were collected on personal/job demographics, sources of job stress, mental health, job satisfaction and coping strategies. It was found that as we moved from the further/higher education level to secondary to primary sectors, the levels of job dissatisfaction and mental ill health rose. In addition, it was found that, with the exception of primary schools, female head teachers in secondary and FHE seem to be suffering significantly greater job dissatisfaction than their male counterparts, although this does not translate itself into mental ill health. Male head teachers, on the other hand, seem to suffer more mental ill health than their female counterparts. And finally, the two main sources of occupational stress that appear in many of the multivariate analyses as predictors

of job dissatisfaction and mental ill health are 'work overload' and 'handling relationships with staff'.

When dissatisfied employers decide to stay on in their profession, the quality of their work is negatively affected as they may lose motivation and passion for their work (Giga, Cooper & Faragher, 2003). Studies amongst health workers show that high job stress lead to increased absenteeism and turnover and decreased productivity and performance (Franco, Bennet, Kanfer & Stubbledine, 2000; Hemingway & Smith, 1999). Low salaries and job stress are the most frequent indicators of job dissatisfaction (Jordan *et al.*, 2003). Job stress occurs when increased job expectations do not match the capabilities, resources or needs of the worker, or when meeting the demands does not bring personal satisfaction (National Institute for Occupational Safety and Health, 1998). In a recent survey of educators in the public sector in South Africa, 29.5% of respondents stated that they *very often* considered leaving the education profession (Shisana *et al.*, 2005). The main reported causes of stress for educators in this sample were workload (24%), coping with changing curricula and evaluation system (outcome-based education) (12.1%), lack of discipline among learners (5.2%), and violence at the workplace (1%) (ibid.).

Earlier studies by Buwalda and Kok (1991) and Marais (1992) report that large proportions (84.2 and 63.7 % respectively) of educators viewed teaching as stressful. Since 1996, curriculum changes and further restructuring of the education sector to fit in with the education and economic demands of the country, have placed increased levels of demand on educators in terms of skills levels and motivation (Hall, Altman, Nkomo, Peltzer & Zuma, 2005). The teaching environment has changed considerably including inclusive education (Department of Education, 2001), leading to increased reported levels of occupational stress amongst educators in South Africa (Van Zyl & Pietersen, 1999). The impact of the HIV/AIDS-epidemic is felt by the education sector through teacher attrition, morbidity and mortality amongst learners and in the communities and increased workload (Coombe, 2000; Crouch & Lewin, 2003; Shisana, Peltzer, Zungu-Dirwayi & Louw, 2005).

Changes in education have been identified as a major source of stress for educators in Britain (Cox, Boot, Cox, & Harrison, 1988). It is not only change, but change-on-change beyond the control of most educators, that is causing distress. Two local studies among secondary school teachers in KwaZulu-Natal and Eastern Cape provinces, respectively, identified stress due to time pressures,

poor working conditions, educational changes, administrative problems and pupil behaviour as related to work stress (Ndigi & Sibaya, 2002; Olivier & Venter, 2003). It is reported that many educators complain about low morale, and illnesses such as hypertension, diabetes, ulcers and heart attacks, while others plan to leave the profession and go on early retirement (Van Wyk, 1998).

The South African Department of Education indicated in its annual report that the status, causes and possible prevention of stress related diseases in educators should be investigated (Department of Education, 2004). Therefore, this study investigated the following objectives:

1. To ascertain the extent to which South African educators experience job stress and job dissatisfaction;
2. To determine the prevalence of stress related illnesses such as hypertension, heart disease, asthma, diabetes, stomach ulcer, mental distress, HIV and AIDS among educators;
3. To determine the relationship between behavioural risk factors (tobacco and alcohol use) and stress related illnesses; and
4. To determine the relationship between job stress, job dissatisfaction and stress related illnesses.

Methods

Sample and procedure

The target population for the study was identified as teachers at public schools. Two data sets were available as potential sample frames from which a sample of educators (teachers) could have been drawn. The first was the DoE's School Register of Needs (SRN) which contained data from surveys in 1996 and 2000 and the second, a database extracted from the government's PERSAL system and made available by the firm, Price Waterhouse Coopers. The SRN data set contained records for 26 713 schools with a total of 356 749 educators. The data set obtained from Price Waterhouse Coopers contained 363 650 records pertaining to state-employed school educators. Due to the size of the file, the exact number of 'educators' could not be determined. An initial sample of 1 750 schools was drawn from the SRN data set. When these were individually compared to the educator information captured in the PERSAL system, the number of state-paid educators at 248 schools could not be identified. The

geographical distribution of these 'missing' schools was such that their exclusion would have resulted in compromising the representivity of the sample.

The sample was thus redrawn and a total of 2 015 schools were identified. When compared to the PERSAL data set, the most recent number of state-paid educators could not be determined for 249 schools. These schools were excluded as the number did not compromise the representivity of the sample as was the case with the original sample of 1 750. The final sample, consisting of 1766 schools, had a total of 356 749 state-paid educators as potential respondents (Shisana *et al.*, 2005).

A cross-sectional study design involving a national probability sample of 1 766 schools was used. In carrying out the study 1714 (or 97%) schools were found in the field (some apparently did not exist) or agreed to participate. During the day of the visit 2 085 educators were absent for a variety of reasons, including being sick (8 %). Of the target number of educators, 20 626 agreed to participate voluntarily. The response rate for questionnaires was 97% and 83% for specimen tested for HIV. The questionnaire included demographic variables such as age, sex, race, socioeconomic status, and rank in the teaching profession. The behavioural items included sexual behaviour, alcohol use, absenteeism, migration and mobility.

The Abbott AXSYM third generation HIV _ g0 blood testing system and the Vironostika HIV Uni-Form II Oral fluid testing system were used to test blood and oral fluid, respectively. The PLG CD4 cell enumeration methodology which identifies white blood cells (total CD45) as the primary reference population for CD4 enumeration (Rehle *et al.*, 2005) was used to determine AIDS prevalence.

Ethical approval for conducting the study was obtained from the Human Sciences Research Council's Ethics Committee (Application Number REC2/ 20/08/030). Informed consent was obtained separately for agreeing to participate in the interview and for providing a specimen for HIV testing. In addition, the result of the HIV test for each participant was linked anonymously to questionnaire data using bar codes.

Registered professional nurses were trained to conduct interviews and collect blood and oral fluid specimens.

Measures

Job stress

A 6-item job stress index was developed by modifying existing scales (e.g. Boyle, Borg, Falzon & Baglioni, 1995; Fimian & Fastenau, 1990; Spielberger, 1994; Spielberger & Reheiser, 1994), and from focus groups with educators, expert interviews, and from a pilot study. After conducting principal component analysis with varimax rotation in the main study three components of job stress, namely (1) teaching methods, (2) educational system and (3) low socio-economic status were identified because together they accounted for the largest portion of total variance (67%). (1) *Teaching methods* included 2 items: I experience stress arising from the implementation of new curricula, pass requirements and reporting systems; I experience stress with the preparation/ assessment involved in applying the OBE approach); (2) *educational system* included 2 items: Performing tasks not in my job description; I experience negative attitudes towards the education department) and (3) *low socio-economic status* included 2 items: I earn an inadequate salary; The teaching profession needs more status and respect from the community. Cronbach alpha for the overall job stress scale was .52. For the components 1 to 3 coefficient alphas ranged from .09 to .82.

The highest factor for job stress was low socio-economic status (2.73), followed by problems with teaching methods and administration (2.48), and problems with the educational system (2.11).

Job satisfaction

A 16-item job satisfaction scale was developed using items from existing scales, (Brown *et al.*, 2001; Lester, 1987; Van Saane, Sluiter, Verbeek & Frings-Dresen, 2003) focus groups with educators and expert interviews. After the piloting the questionnaire and conducting item and principal component analysis, using varimax rotation six components were identified to be the most appropriate for measuring job satisfaction and included in the questionnaire used in the main study. These factors included: (1) *Career advancement and recognition* (4 items: Teaching provides possibilities for promotion; Teaching provides ample career development opportunities; I have the opportunity to participate in decision making on my institution's policies; I receive recognition for my work as an educator), (2) *peer support* (3 items: I get along well with my colleagues; My colleagues and I support each other; My colleagues and I are united in our

dedication towards teaching), (3) *working hours/load/policies* (3 items: My workload is not too high; I am satisfied with the content of the policies that affect my job; Teaching offers reasonable working hours (despite extra-curricular activities)), (4) *discipline and respect* (2 items: My learners respect me as an educator; Most of my learners are well-disciplined), (5) *community enhancement* (2 items: Teaching provides me with opportunities to assist in shaping the future of young people; Teaching provides me with opportunities to empower people with meaningful knowledge and information) and (6) *job security* (2 items: Teaching provides me with job security; I am afraid that I will be forced to take up a teaching position in an area/school/college where I do not want to teach). Cronbach alpha for the overall job satisfaction scale was .71, and for the individual components the coefficient alphas ranged from .47 to .73.

Theorectical model

Most of the components of two "models" 1. The Demand/Control Model (Karasek & Theorell, 1990) and 2. The Effort/Reward Imbalance Model (Siegrist, 1996) were included in the job stress and job satisfaction scales.

Job stress from *teaching methods* (2 items: I experience stress arising from the implementation of new curricula, pass requirements and reporting systems; I experience stress with the preparation/assessment involved in applying the OBE approach), job stress from the *educational system* (2 items: Performing tasks not in my job description; I experience negative attitudes towards the education department) and *peer support* (I get along well with my colleagues; My colleagues and I support each other; My colleagues and I are united in our dedication towards teaching) refer to three components of the demand/control model: (1) High Job Pressure: having too much to do over too long a period with constant imposed deadlines, (2) Low Job Control: having too little influence over the day-to-day organization of your own work, and (3) Social Support: having at least one person who can be relied on for emotional support during times of distress or unhappiness.

Job stress from *low socio-economic status* (I earn an inadequate salary; The teaching profession needs more status and respect from the community), *lack of career and community advancement as well as low job security* refer to the Effort/Reward Imbalance Model: high mental or physical energy expended to achieve an organizational goal and low compensation for or acknowledgement of effort in terms of bestowed status, financial gain or career advancement.

Socio-demographics

Socio-demographic variables such as sex, race, age group, urban/rural, living arrangement, marital status and income and education were obtained through a self-reported questionnaire.

Stress related illnesses

Information about chronic diseases/conditions diagnosed in the past five years, current tobacco and risky drinking status were obtained from self-reported questionnaires. Alcohol use was assessed with the ten item Alcohol Use Disorder Identification Test (AUDIT) (Babor, Higgins-Biddle, Saunders & Monteiro, 2001). Standard drinking units were adjusted to the South African context (one unit 12 g alcohol), and sex differences were included for binge drinking, namely for men five or more and for women four or more drinks on one occasion. Cronbach alpha for the AUDIT in this sample was .78.

Mental *distress* was measured with one item from the CDC Health Related Quality of Life (HRQOL-4) including the question reporting the number of days during the previous 30 days in which the respondent's mental health was not good. The sum of the measure results in the total number of "mentally distressed days" (ranging from 0 to 30 days). In this study 7 to 13 days of being mentally distressed in the past month was classified as minor mentally distressed and 14 days and more as major mentally distressed. The CDC Health Related Quality of Life (HRQOL-4) measure had an acceptable test-retest reliability and strong internal validity in a representative sample in the US (Andresen, Catlin, Wyrwich & Jackson-Thompson, 2003).

Data management and statistical analysis

The data were double entered and verified using Microsoft Access. The data were converted to Statistical Package for Social Sciences (SPSS) for exploratory analysis. The data are multilevel in nature and sampling weights were calculated to correct for potential biases. To investigate the prevalence of stress related illnesses chi-square analyses (Neuman, 1997) were performed to express the strength of the relationship between stress related illnesses and age, sex, race group, position in the school system and school type. Because of the large sample size, normal statistics may show significant differences while the effect of the difference in the prevalence rates is very small. This can be corrected by

calculating the effect size, in the form of the contingency value. According to Cohen (1988) a contingency value of less than .1 indicates a small effect, .3 a medium and .5 and more a large effect.

Pearson correlation was used to assess associations between stress related illnesses such as hypertension, minor mental distress and hazardous or harmful drinking and job stress and job dissatisfaction.

Results

The study had 21 307 educators with a mean age of 40 years (SD = 8.05; range 18-69). Due to the education profession being predominantly female, 68% of respondents were female and 32% male (see Table 1).

Table 1: Demographic distribution of the sample

Demographics	N	Percentage
Sex of the respondent		
Male	6 580	32.2
Female	14 018	67.8
Race		
African	14 439	77.4
White	2 778	10.1
Coloured	2 705	8.11
Asian	623	4.41
Age in years		
18-24	272	1.13
25-34	5 135	25.4
35-44	8 965	44.5
45-54	5 189	23.9
55 and above	1 040	5.0

Stress related illnesses

Among the educators studied the four most prevalent stress related conditions included hypertension (15.6%), stomach ulcer (9.1%), diabetes (4.5%) and

major mental distress (3.9%). Among those educators who tested HIV positive (12.7%) and whose CD4 count was tested the majority (60%) had a CD4 count of less than 350 (cf. Rehle & Shisana, 2005). Most stress related illnesses were more prevalent among women compared to men. Hypertension, stomach ulcer, asthma and mental distress were more prevalent among women than men while diabetes was more prevalent in men than women. With regards to substance use, 12% of educators reported use of tobacco daily or almost daily and 5.3% were using alcohol hazardously or harmfully using a cut off of eight and above on the AUDIT.

Hazardous drinking is defined as a quantity or pattern of alcohol consumption that places patients at risk for adverse health events, while harmful drinking is defined as alcohol consumption that results in adverse events (e.g., physical or psychological harm). Clearly, more men used tobacco and were more hazardous or harmful drinkers than women. These differences were statistically significant ($P<.001$) and had a medium effect on the two variables (C >.1; C <.03) (see Table 2).

The results further indicate that there is a significant association between high blood pressure and race. Coloured educators were significantly more likely to have high blood pressure than other racial groups. Black African educators were more likely to have stomach ulcers and Indian educators likely to have diabetes than any other race. Mental distress was highest among Indian and White educators, and tobacco use and hazardous or harmful drinking highest among Coloured educators. Considering effect size calculations only for tobacco use and major mental distress small effects were observed for racial differences. As expected age was related to hypertension and diabetes; being older than 30 years was indicative for higher rates of hypertension, diabetes and stomach ulcer, while being younger (less than 30 years) was indicative for more mental distress and asthma. Heart disease, tobacco and alcohol use were equally distributed among the two age groups of less and more than 30. Considering effect size calculations no effects were found for age differences (see Table 3).

Primary school educators were more likely to have hypertension, diabetes, stomach ulcer, asthma and mental distress than educators at a secondary or combined school. However, the self-rated use of tobacco and risky alcohol use were higher in secondary and combined schools than in primary schools. Considering effect size calculations no significant differences were found for school types. Rank at school was associated with certain health conditions, for

Table 2: Prevalence of stress related illnesses by gender

	Total number of respondents	Prevalence of the condition (%)	Men (Prevalence in %)	Women (Prevalence in %)	χ^2	p-value C-value
Hypertension	20 231	15.63	12.8	17.0	43.33	P<.001 C=.046
Heart disease	20 046	1.96	1.8	2.0	.89	P=.34 C=.00
Diabetes	20 191	4.53	5.2	4.2	6.69	P<.01 C=.01
Stomach ulcer	20 076	9.13	8.4	9.5	4.93	P<.05 C=.016
Asthma	20 078	3.5	2.3	4.1	53.99	P<.00 C=.05
HIV+ (CD4 <350)	1 059	59.7#	64.3	57.4	4.67	P<.05 C=.066
Minor mental distress	828	3.9	2.9	4.4	26.72	P<.001 C=.036
Major mental distress	801	3.8	2.8	4.3	25.00	P<.001 C=.035
Tobacco use (daily/almost daily)	20 489	11.99	20.7	5.6	1 116.00	P<.001 C=.225
Hazardous or harmful drinkers	20 303	5.30	13.5	0.6	1 635.44	P<.001 C=.273

note re CD4 cell counts

Table 3: Prevalence of stress related illnesses by race and age group

	African	White	Indian/ Coloured	Asian	χ^2	p-value C-value	<30 yrs	30 yrs & more	χ^2	p-value C-value
Hypertension	16.2	15.2	21.2	13.7	50.11	P<.001 C=.050	6.1	17.5	129.93	P<.001 C=.080
Heart disease	1.8	2.9	2.5	3.8	24.44	P<.001 C=.035	1.8	2.1	.77	P=.38 C=.006
Diabetes	4.5	2.5	5.4	10.1	74.30	P<.001 C=.061	1.2	4.8	41.29	P<.001 C=.045
Stomach ulcer	10.7	5.8	4.1	8.2	157.70	P<.001 C=.088	7.3	9.2	6.51	P<.01 C=.018
Asthma	3.3	4.8	4.2	7.5	42.13	P<.001 C=.046	3.6	3.7	.06	P=.80 C=.002
HIV+ (CD4 <350)	59.7	.0	66.7	.0	3.14	P=.21 C=.054	55.4	60.1	.75	P=.39 C=.027
Minor mental distress	3.1	5.8	5.4	8.4	100.14	P<.001 C.=0.69	4.6	3.9	1.68	P=.20 C=.009
Major mental distress	2.1	8.8	6.4	9.4	413.50	P<.001 C.=.139	4.8	3.8	4.02	P<.05 C=.014
Tobacco use (daily/ almost daily)	7.0	12.9	26.2	11.6	922.88	P<.001 C.=.206	10.7	10.5	.08	P=.79 C=.002
Hazardous or harmful drinkers	5.1	1.1	7.1	2.1	130.15	P<.001 C.=080	4.7	4.7	.001	P=.98 C=.000

example, being in a senior position as educator was associated with having hypertension, diabetes and heart disease (this is an artifact of age—senior educators are likely to be older), while junior educators were more likely to have a stomach ulcer and asthma. Mental distress, alcohol and tobacco use were equally distributed across junior and senior educators. However, considering effect size calculations no significant differences were found for position in school (see Table 5).

Daily or almost daily tobacco use and hazardous or harmful drinking were significantly associated with having hypertension, stomach ulcer, mental distress and lower CD4 counts among HIV positive educators. However, considering effect size calculations no significant differences were found for tobaccos use and drinking in relation to stress-related illnesses (see Table 4).

Table 4: Health behaviour and stress related illnesses in percent

	Tobacco use (daily/ almost daily)				Hazardous or harmful drinkers			
	Yes	No	χ^2	p-value C-value	Yes	No	χ^2	p-value C-value
Hypertension	17.1	16.6	.42	P=.52 C=.005	19.5	16.4	5.95	P=.02 C=.017
Heart disease	2.2	2.1	.06	P=.81 C=.002	2.4	2.1	.25	P=.62 C=.004
Diabetes	4.7	4.5	.13	P=.72 C=.003	4.8	4.5	.18	P=.67 C=.003
Stomach ulcer	10.3	8.9	4.85	P=.03 C=.015	15.3	8.8	46.39	P<.001 C=.048
Asthma	2.9	3.8	4.65	P=.03 C=.015	1.8	3.8*	9.79	P=.002 C=.022
HIV+ (CD4 <350)	62.3	59.4	.33	P=.57 C=.018	69.2	59.2	3.03	P=.08 C=.05
Minor mental distress	5.7	3.7	22.80	P<.001 C=.033	5.6	3.9	6.86	P=.009 C=.018
Major mental distress	6.8	3.4	64.43	P<.001 C=.055	5.9	3.8	10.06	P=.002 C=.022

Table 5: Prevalence of stress related illnesses by school type and position (junior=educator; senior=senior, deputy, principal educator) in school

	Primary	Secondary	Combined	χ^2	p-value C-value	Junior position	Senior position	χ^2	p-value C-value
Hypertension	18.7	12.9	16.4	91.94	P<.001 C=.067	15.2	20.9	83.57	P<.001 C=.065
Heart disease	2.3	1.7	2.4	8.82	P<.01 C=.021	2.0	2.5	5.27	P=.02 C=.016
Diabetes	5.1	3.5	4.5	23.49	P<.001 C=.034	3.8	6.9	84.56	P<.001 C=.065
Stomach ulcer	9.4	8.7	8.7	3.00	P=.22 C=.012	9.2	8.8	.47	P=.49 C=.005
Asthma	4.1	3.3	3.7	10.39	P=.006 C=.023	3.9	3.4	1.86	P=.17 C=.010
HIV+ (CD4 <350)	59.8	59.2	60.3	.049	P=.98 C=.007	58.9	62.8	.95	P=.33 C=.030
Minor mental distress	4.1	3.7	3.6	2.29	P=.32 C=.010	3.9	4.2	.96	P=.33 C=.007
Major mental distress	4.0	3.7	3.1	5.47	P=.07 C=.016	3.9	3.9	.003	P=.96 C=.000
Tobacco use (daily/almost daily)	9.5	10.7	12.1	20.51	P<.001 C=.065	10.6	10.8	.19	P=.66 C=.003
Hazardous or harmful drinkers	3.6	6.8	4.8	87.02	P<.001 C=.031	4.7	4.6	.14	P=.71 C=.003

Job stress and job dissatisfaction

Given a score range from 1 to 3, an overall mean of 2.45 seem to indicate considerably high stress levels among educators. Without controlling for a potential confounder of age, stress levels did not differ by sex and position in the school system; however, older educators seem to report higher stress levels than younger educators. Across all three measured components of job stress, older female educators indicated higher stress levels than younger male educators related to stress levels resulting from problems with teaching methods and administration. Moreover, older junior male educators indicated the highest stress with low socio-economic status as compared to younger, senior female educators. However, considering effect size calculations no significant differences were found for sex, position in school and age in relation to job stress (see Table 6).

Given an overall score of 1.61, job dissatisfaction can be considered as generally low (ranging from 1 to 3, 3 being the highest dissatisfaction). There were no differences in job dissatisfaction levels by sex and age; however, educators in a junior position reported higher job dissatisfaction levels than educators in a senior position. Looking at the six different components of job dissatisfaction, young educators in a junior position in school were more dissatisfied with their job in terms of career advancement and recognition, discipline and respect, and job security than older educators in a senior position at school. On the other hand older educators in a senior position at school were more dissatisfied with the teaching structure than younger educators and educators in a junior position. However, considering effect size calculations no significant differences were found for sex, position in school and age in relation to job dissatisfaction (see Table 7).

Job stress and stress related illnesses

Job stress was weakly associated with seven out of ten stress related illnesses. However, considering effect size calculations (=r) no significant differences were found between job stress and stress related illnesses. Looking at the three different job stress components analysed here, job stress from teaching methods and stress from the educational system contributed more to stress related illnesses than stress from being in the low socioeconomic status group (see Table 8).

Table 6: Job stress by sex, age and position in school system

	Total	Male	Female	r	Junior position	Senior position	r	Age below 30	Age 30 and above	r
Problems with teaching methods and Administration	2.48#	2.42	2.50	.05*	2.48	2.47	-.00	2.30	2.49	.06*
Problems with educational system	2.11	2.17	2.09	-.06*	2.10	2.16	.04	2.09	2.12	.01
Low socio-economic status	2.73	2.74	2.73	-.02	2.74	2.71	-.04	2.69	2.73	.03*
Total	**2.45#**	**2.45**	**2.44**	**-.01**	**2.44**	**2.45**	**.01**	**2.36**	**2.45**	**.05***

#Total item means range from 1 to 3 (the higher the score, the more stress); *p<001

Table 7: Job dissatisfaction

Lack of	Total	Male	Female	r	Junior position	Senior position	r	Age below 30	Age 30 and above	r
Career advancement and recognition	1.61	1.61	1.61	-.0	1.62	1.56	.04	1.65	1.60	.02
Peer support	1.16	1.86	1.84	.0	1.85	1.85	-.01	1.87	1.85	.02
Teaching structure	1.87	1.88	1.87	.01	1.86	1.91	-.04*	1.79	1.88	-.04*
Discipline & respect	1.39	1.39	1.39	.01	1.40	1.33	.06*	1.42	1.38	.01
Community enhancement	1.07	1.06	1.07	-.02	1.07	1.06	.01	1.05	1.07	-.01
Job security	1.88	1.86	1.89	-.03	1.91	1.79	.08*	1.93*	1.88	.00
Total	**1.61**	**1.61**	**1.61**	**-.01**	**1.64**	**1.58**	**.05***	**1.64**	**1.61**	**.01**

#Total item means range from 1 to 3 (the higher the score, the more dissatisfaction); *p<001

Table 8: Pearson correlation between job stress and stress related illnesses

	Stress-Teaching Methods r	Stress-Educational System r	Stress-Low SES r	Total job stress r
Hypertension	.037*	.008	-.001	.025*
Heart disease	.020*	.024*	.000	.026*
Diabetes	.006	.005	-.006	.004
Stomach ulcer	.040*	.010	.008	.031*
Asthma	.018	.017	-.015	.016
Minor mental distress	.060*	.043*	.010	.062*
Major mental distress	.064*	.089*	.000	.088*
HIV+ (CD4 <350)	-.009	.045	.026	.029
Tobacco use (daily/almost daily)	.002	.046*	.002	.027*
Hazardous or harmful drinkers	.023*	.015	.006	.023*

*P<.001

Job dissatisfaction

Overall job dissatisfaction was weakly associated with seven out of ten stress related illnesses. However, considering effect size calculations (=r) only a small effect of job dissatisfaction was found on major and minor mental distress; no other significant differences were found between job dissatisfaction and stress related illnesses. Examining the association among the different components of job dissatisfaction, poor teaching structure was associated with most stress related illness (n=7) followed by lack of career advancement and lack of discipline (n=5), and lack of discipline (n=4). All but one job dissatisfaction components were associated with mental distress (see Table 9).

Gender

Hypertension was found to be related to job stress among men (Hypertensive: M=17.1, SD=2.8; non-hypertensive: M=16.7, SD=3.0)) (F=11.90, P<.001) (but not significant considering an effect size of *r*=.03) but not among women (Hypertensive: M=16.8, SD=3.0; non-hypertensive: M=16.7, SD=2.8) (F=1.22, ns).

Table 9: Pearson correlation between job dissatisfaction and stress related illnesses

	Lack of career advnce-ment r	Low peer sup-port r	Lack of disci-pline r	Low com-munity enhanc-ement r	Low job secu-rity r	Poor teach-ing stru-cture r	Total job dis-satisf-action r
Hypertension	-.026*	.010	.010	.016	-.013	.026*	.001
Heart disease	.016	.009	.008	.004	-.003	.034*	.025*
Diabetes	-.012	.003	-.000	.017	-.026*	-.003	-.010
Stomach ulcer	.024*	.039*	.034*	.010	.032*	.031*	.048*
Asthma	.022	.021	.012	.014	-.026*	.032*	.028*
Minor mental distress	.075*	.050*	.067*	.024*	.005	.082*	.100*
Major mental distress	.147*	.066*	.107*	.068*	.005	.125*	.171*
HIV+ (CD4 <350)	-.010	.048	.005	.033	.060	.016	.023
Tobacco use (daily/ almost daily)	.040*	.010	.039*	.007	-.021*	.033*	.042*
Hazardous or harmful drinkers	.014	.056*	.011	.00-	-.006	.011	.036*

*P<.001

Position in school

There were no difference between junior (M=16.8, SD=3.0) and senior (M=16.7), SD=2.9) educators regarding job stress levels (F=3.45, P=.06), however, senior educators (M=38.0, SD=4.9) had significantly higher job dissatisfaction levels than junior educators (M=37.8, SD=5.2) (F=6.95, P=.008). The latter was, however, not significant considering an effect size of r=.01).

Discussion

This study included a large nationally representative sample of public educators (n=21 307) in South Africa. The prevalence of stress-related illnesses were 15.6% for hypertension, 9.1% stomach ulcer, 4.5% diabetes, 3.9% major mental distress, 3.8% minor mental distress, 3.5% asthma and among those HIV positive educators whose CD4 count was tested the majority (60%) had a CD4

count of less than 350. The prevalence of self-reported hypertension and diabetes among educators seemed higher (hypertension: 12.8% in men and 17.0% in women and diabetes: 5.2% in men and 4.2% in women) than among the general population (which included 65 years and older) (hypertension: 8.8% in men and 18.8% in women and diabetes: 2.6% in men and 3.9% in women), while the self-reported prevalence of heart disease and asthma was lower among educators (heart disease: 1.8% in men and 2.0% in women and asthma: 2.3% in men and 4.1% in women) than among the general population (heart disease: 2.7% in men and 3.9% in women and asthma: 3.0% in men and 4.4% in women) from the Demographic and Health Survey in 2003/4 (Department of Health, 2007).

Most stress related illnesses were more prevalent among women than men but considering effect size calculations on tobacco use and hazardous or harmful drinking were significantly more prevalent in male as compared to female teachers. With regards to substance use 18.8% of male and 4.0% of female educators reported to use tobacco daily or almost daily and 13.5% of male and 0.6 of female educators were using alcohol hazardously or harmfully. These tobacco use and drinking rates among educators are lower than in the general population: daily tobacco use: 31.2% in men and 8.4% in women (Department of Health, 2007) and hazardous or harmful alcohol use: 12.7% in men and 2.2% in women (Shisana, Peltzer, Zungu-Dirwayi & Louw, 2006).

The study found considerably high stress levels among educators. Similar to other studies with educators in South Africa (Ndigi & Sibaya, 2002; Olivier & Venter, 2003), this study also found high job stressors related to time pressures, educational changes, administrative problems, educational system, professional distress and pupil misbehaviour among educators. Across all three measured components of job stress, older female educators indicated higher stress levels than younger male educators related to stress levels resulting from problems with teaching methods and administration. Nidigi and Sibaya (2002) and Olivier and Venter (2003) also found educational changes and administrative problems as a significant source for job stress among educators in KwaZulu-Natal and the Eastern Cape.

Moreover, older junior male educators indicated the highest stress with low socio-economic status as compared to younger, senior female educators. Educators in a junior position reported higher job dissatisfaction levels than educations in a senior position. Similarly, in a study among educators in the

United Kingdom, Cooper and Kelly (1993) found that the levels of job dissatisfaction increased from higher to lower educational positions.

The study found that job stress was weakly associated with most stress related illnesses (hypertension, heart disease, stomach ulcer, mental distress, smoking, hazardous or harmful alcohol use, and diabetes) but was no longer significant considering effect size calculations. Stress from teaching methods seemed to have higher impact on stress related illnesses than other components of the job stress scale. From three components of the demand-control model two, namely work stress from teaching methods and the educational system, but low peer support was not related to heart disease. The components of the effort-reward model of low socio-economic status and lack of career advancement were both not related to heart disease and only lack of career advancement was inversely related to hypertension. Most components assessed here of the demand-control model (including stress with teaching methods and educational system, low peer support) and effort-reward model (including job insecurity and lack of career advancement) were related to stomach ulcer and mental distress.

Kwawakami and Haratani (1999) also found among Japanese working populations that the job demands-control model as well as the use of new technology at work, was associated with higher levels of blood pressure and serum lipids. The job effort-reward model was found to be related to adverse health outcomes prominent among which are cardiovascular disease and mental health problems such as anxiety and depression (Siegrist, 1996). Various studies have shown associations between job stress and hypertension and heart disease (Ducher et al., 2006; Kuper & Marmot, 2003; Tsutsumi *et al.*, 2001), mental distress (Cooper & Kelly, 1993), tobacco use (Shigemi *et al.*, 1999) and heavy alcohol use (Dawson *et al.*, 2005).

Hypertension was found to be related to job stress among men (but no longer significant considering effect size calculations) but not among women, which is supported by other studies (Cesana *et al.*, 2003; Pickering, 1997). Blood pressure tends to be prevalent in the work place, and studies using ambulatory monitoring have shown that occupational stress, measured as job strain, can raise blood pressure in men, but not women. This may be associated with increased left ventricular mass. The diurnal blood pressure pattern in men with high strain jobs shows a persistent elevation throughout the day and night, which is consistent with the hypothesis that job strain is a causal factor in the development of human hypertension (Pickering, 1997).

While other stressors are undoubtedly involved in the development of illnesses and in the chain of causation leading to illnesses, high demand and low control coupled with high effort and low reward conditions play a disproportionately important role in this regard. From a workplace health policy point of view, these conditions are clearly the prime targets (Karasek & Theorell, 1990; Schnall & Landsbergis, 1994). There is good evidence that most of these health outcomes can be modified by introducing changes to the organization of work with particular attention being paid to increasing control and reward conditions. In other words, individual health outcomes are responsive to organizational changes. Stress can be abated "at source" and this will produce positive health outcomes (Israel, [illegible]).

It is therefore recommended that principals and the Department of Education acknowledge emotional and physical health of teachers as important contributors to their efficient job functioning. Provision should be made for balance in their work programme for each year and changes to the organization of work with particular attention being paid to increasing control and reward conditions. Coping with stress cannot be seen in isolation, but should cover all aspects of daily living. Individual teachers must find ways to manage stress, for example, physical exercise and recreational activities, enough sleep, and a healthy diet, the use of internal stress management strategies, such as positive self-talk, stress relief thinking, relaxing exercises and rest, develop his/her own personal plan to combat stress, for example, delegation of responsibilities, setting of realistic goals, better time-management and realistic self-assessment, to appoint admin assistants and social workers to deal with orphan issues, HIV positive educators. Belonging to a support group can also help teachers to handle stress more effectively through the supportive relationship. In the case of serious problems teachers should consider external support strategies and obtain professional help, for example, medical help, therapy, learning of appropriate skills, or counselling (Beard, 1990; Olivier & Venter, 2003; Shisana *et al.*, 2005; Squelch & Lemmer, 1994).

Further, we recommend that unions with the financial support of the Department of Education and donor agencies establish and manage a work place programmes specifically to provide a comprehensive prevention and treatment programme for all illnesses (including HIV/AIDS and TB) but ensuring confidentiality for educators. Such a programme would include stress reduction involving counselling, assessment of workload and adjustment thereof, blood pressure and diabetes screening and treatment. A programme such as this may have

several benefits: First, it may help educators reduce stress; second, provide a "one stop" comprehensive prevention and treatment centre near the school where teachers can easily access it; third, reduce absenteeism from school since there will be no need to miss school to see a health care provider; fourth, it will help monitor adherence to treatment for TB and HIV/AIDS; fifth, access to drugs that can prolong life will be important in ensuring an improvement not only in the quality of life but also in maintain and improving on the quality of education. Treatment and brief interventions aimed at problem drinkers might benefit from addressing the issue of tension alleviation and the development of alternative coping mechanisms (Shisana *et al.*, 2005).

Limitations

The study used self-report measures to assess the prevalence of most stress-related illnesses and the measures used for job stress and job dissatisfaction were short and did not cover all components of job stress and dissatisfaction. Although the measures of job stress and job dissatisfaction covered major components of the job stress demand-control and effort-reward models, the number of items in each scale and on each sub-scale or factor were small, and the loading on the factor "low socio-economic status" was too low and resulted in a low Cronbach alpha for the overall job stress scale. This should be corrected in further studies assessing job stress among educators.

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