PREVALENCE AND FACTORS ASSOCIATED WITH STRESS AMONG SECONDARY SCHOOL TEACHERS IN KOTA BHARU, KELANTAN, MALAYSIA

Azlihanis Abdul Hadi[1], Nyi Nyi Naing[2], Aziah Daud[1], Rusli Nordin[1,3] and Mohd Rahim Sulong[1]

[1]Department of Community Medicine, School of Medical Sciences; [2]Unit of Biostatistics and Research Methodology, School of Medical Sciences; [3]School of Dental Sciences, Universiti Sains Malaysia, Health Campus, Kubang Kerian, Kelantan, Malaysia

Abstract. The teaching profession is an occupation at high risk for stress. This research attempted to determine the prevalence of stress and the associated factors contributing to stress among teachers in Malaysia. A cross-sectional study was conducted on 580 secondary school teachers in Kota Bharu District. The instrument used to carry out the study was adopted and modified from the Depression, Anxiety and Stress Scale (DASS 21) and Job Content Questionnaire (JCQ). The questionnaire consisted of two parts: Part I consisting non-job factors (socio-demographic characteristics) and Part II consisting of psychosocial factors contributing to stress. Simple and multiple linear regression analysis were carried out. The prevalence of stress was reported as 34.0%. Seventeen point four percent of teachers experienced mild stress. Age, duration of work and psychological job demands were significantly associated with stress level. This study indicates job-related factors did not contribute much to stress among secondary school teachers. Non-job-related factors should be further studied to determine methods for stress reduction in teachers in Malaysia.

INTRODUCTION

Teacher stress is defined as experiences in teachers of unpleasant, negative emotions, such as anger, frustration, anxiety, depression and nervousness, resulting from some aspect of their work as teachers (Kyriacou, 2001). The amount of research on teacher stress has increased steadily, and has now become a major research topic in many countries (Vandenberghe and Huberman, 1999; Kyriacou, 2001; Hanizah, 2003). Social, cultural, economic and educational differences between countries mean that one must be cautious in applying research carried out in one country to another country. It is important for research regarding teacher stress to be carried out in individual countries, where local circumstances can be taken into account in the design of the study.

The teaching profession has been categorized as an occupation at high risk for stress (Chan and Hui, 1995; Pithers and Forgaty, 1995). The Health and Safety Executive (2000a) in the United Kingdom reported that teaching was the most stressful occupation, compared to other occupations, such

Correspondence: Naing Nyi Nyi, Biostatistics and Research Methodology Unit, School of Medical Sciences, Universiti Sains Malaysia, Health Campus, Kubang Kerian, Kelantan, Malaysia. E-mail: nyi@kb.usm.my

as nursing, managing, professional and community service occupations. It was also reported that two out of five teachers in the United Kingdom experienced stress, compared to one in five workers from other occupations.

Okebukola and Jegede (1989) developed a questionnaire in order to study factors related to occupational stress among teachers in Nigeria. They found five main factors related to stress: student factors, teacher factors, the school working environment, administrative procedures and service conditions. Female teachers were more influenced by the school environment and administrative procedures than male teachers. Those who were not married found student factors caused greater levels of stress than in those who were married.

Borg *et al* (1991) produced a questionnaire to investigate occupational stress among teachers. They found the major causes of stress were problems of student attitudes, problem with time and resource management, lack of professional recognition and interpersonal relationships. Boyle *et al* (1995) validated these dimensions in order to form one model of factors associated with occupational stress; they found workload was another factor besides the above four.

Studies carried out in Malaysia identified several factors contributing to stress among teachers, such as use of information technology (Hanizah, 2003), years of experience in teaching (Mokhtar, 1998), the working environment and feelings of responsibility (Ismail, 1998); the school type and perceptions of inadequate school facilities (Chan, 1998).

Teachers are at increased risk for burnout. Measuring teacher stress is important and can play an important role in understanding the processes that lead to teacher burnout. Burnout is described as the inability to perform both functionally and effectively in employment settings due to extensive exposure to job-related stress (Dorman, 2003). The aim of this study was to explore stress among teachers in secondary schools in Kota Bharu, Kelantan, Malaysia. The researchers sought to determine the prevalence of teacher stress and its associated factors.

MATERIALS AND METHODS

Subjects

A cross-sectional study was conducted in 20 secondary schools under the authority of the Kota Bharu District Education Office, Kota Bharu, Kelantan, Malaysia. A simple random sampling technique was applied to select study subjects. All subjects were recruited at the school office after given written consent. Self-administered questionnaires were distributed to 580 teachers. The teachers were asked to reform the questionnaire three days later. The returned questionnaires were checked on site to assure completeness.

The study protocol was approved by the Research and Ethics Committee, School of Medical Sciences, Universiti Sains Malaysia in January, 2005.

Job Content Questionnaire

The Job Content Questionnaire (JCQ) was based on the Karasek's Demand-Control Model and was used to determine the psychosocial factors contributing to stress. The JCQ has four sections: the first was to assess for psychosocial strain; the second was assessing psychological and physical strain; the third was to evaluate technology and the fourth was to assess wages and hours. All questionnaires were scored on a Likert scale of 1 to 4 (strongly disagree, disagree, agree and strongly agree). In this

study, job factors investigated were psychological job demand, decision latitude (skill discretion, decision authority), supervisor support, coworker support, job insecurity, physical exertion and hazardous conditions. All the job factors were from section one of the JCQ.

Reliability and construct validity of the Malay version of the questionnaire was done among secondary school teachers in Kota Bharu, Kelantan, Malaysia. A total of 68 teachers consented to participate in the study. Data regarding their responses were collected using a Malay version of the JCQ. Reliability was determined using Cronbach's alpha for internal consistency whilst construct validity was assessed using factor analysis. The Cronbach's alpha coefficients revealed decision latitude of 0.75, psychological job demand of 0.50 and social support of 0.84. Factor analysis showed three meaningful common factors that could explain the construct of the Karasek's demand-control-social support model. The study demonstrated the three scales of the JCQ were reliable and valid for assessing the psychosocial work conditions of secondary school teachers, although further studies are needed to improve the psychological job demand scale (Azlihanis *et al,* 2006).

Depression Anxiety and Stress 21 Items Questionnaire

Stress level was measured using the Depression Anxiety and Stress 21 Items Questionnaire (DASS 21). It is a shorter version of the DASS 42. DASS questionnaire is a set of three self reported scales designed to measure the negative emotional states of depression, anxiety and stress. The DASS was developed by Lovibond and Lovibond (1995) which has been increasingly used in diverse settings. The DASS questionnaire measures negative emotional states based on clinical symptoms and meets the require-

ments of both researchers and scientists (professional clinicians). The use of the DASS questionnaire as an objective measure of health indicator (depression, anxiety and stress) in combination with the JCQ show the direct effect of job stress on the health problem as recommended by Harmy (2001).

The DASS is not meant for clinical diagnosis according to discrete diagnostic categories postulated in classificatory systems, such as the DSM and ICD. This is because the DASS is based on a dimensional rather than a categorical conception of psychological disorders. A key strength of the DASS is its ability to assess depression, anxiety and stress in a brief and psychometrically sound manner (Brown *et al,* 1996).

Even though the DASS 42 gives a more reliable score and more information about specific symptoms, the DASS 21 has the advantage of taking only half the time to administer. There are several published studies showing that the DASS 21 has the same factor structures and gives results similar to the DASS 42 (Antony *et al,* 1998; Henry and Crawford, 2005). The DASS 42 is preferable for clinical work and the DASS 21 is often used for research purposes.

All questions were scored on a Likert scale of 0 to 3, "Did not apply to me at all", "applied to me to some degree or some of the time", "applied to me to a considerable degree or a good part of time", "applied to me very much or most of the time". Subjects were asked to answer to question based on their experiences over the past week.

Scores for stress was calculated by summing the scores for the item using the DASS 21 answer template. The severity rating for stress depended on the score: normal, mild, moderate, severe and extremely severe, stress.

Data analysis

Data analysis was done using the Sta-

tistical Program for Social Science (SPSS) version 12.0 for Windows. For job factors, such as decision latitude, skill discretion, decision authority, psychological job demand, supervisor support, co-worker support, physical exertion, hazardous conditions and job insecurity, these were calculated using the formulae of the Job Content Instrument.

The data was first analyzed using descriptive statistic to give an overview of the distribution of the data. For socio-demographic characteristics, job characteristics and prevalence of stress, means and standard deviations were used to describe normally distributed continuous variables and medians and inter-quartile ranges for non-normally distributed continuous variables. Frequencies and percentages were used for categorical variables.

Associations between stress score and job factors were analyzed using multiple linear regressions analysis. Before proceeding to multiple linear regression (MLR), scatter plots between outcome variables (stress score) and numerical independent variables were plotted to find any associations. On univariable analysis, simple linear regression (SLR) was used for the numerical and categorical independent variables. Categorical variables with small cells, which were not significant at the univariate level, were collapsed and the small cells were combined where clinically meaningful and reanalyzed using SLR.

For MLR analysis, to obtain the preliminary main effect model, variable selection was done using an automatic forward and backward stepwise procedure. The model with the variables chosen from those two procedures were rechecked with only the selected variables because in the stepwise procedure, only subjects with full data were analyzed and subjects with incomplete data or missing values were excluded. After that,

manual backward elimination was carried out to get only the variables with a significant association with the outcome. Before obtaining the preliminary main effect model, manual forward inclusion was carried out, whereby all the previously excluded variables were tested one by one to ensure that no significant variables were left out before model refinement was done.

For fine modeling, all two-way-interaction terms of independent variables chosen in the preliminary main effect model were checked. Multicollinearity was checked with the variables in the preliminary main effect model and with all the other excluded variables to ensure that they were not excluded due to multicollinearity problems with other variables. A serious multicollinearity problem was assumed present if the variance inflation factor (VIF) was equal to or greater than ten, which required remedial action.

Before abtaining the final model, assumptions, overall model fitness, functional forms of variables and outliers were checked. Unstandardized predicted values (linear prediction) and standardized residuals (error terms) were calculated using software from the fitted model. Normality assumption was checked by plotting a histogram of standardized residuals and checking the normality of the histogram distribution. A scatter plot of standardized residuals on the *y*-axis and unstandardized predicted values on the *x*-axis was made to check for linearity and equal variance assumptions. Linearity was assumed if the error terms (standardized residuals) appeared randomly scattered on both sides of and along the zero line. This also reflected a good overall fitness of the model. Equal variance assumption was satisfied if the variance of the error terms (dispersion from the zero line) appeared to be constant along the unstandardized predicted value.

A scatter plot of the standardized residuals on the *y*-axis and the numerical independent variables on the *x*-axis was made to check the appropriateness of the functional forms of the variables. A scatter plot of the standardized residuals on the *y*-axis and the numerical independent variables not in the model on the *x*-axis was also made to check for any relationship with outcome variables.

After the assumptions and fitness were satisfied, the result was the best fit model, which without interaction, an interpretation of the model was obtained. Results were presented with crude and adjusted regression coefficients, 95% confidence intervals (CI), *t*-statistics with degrees of freedom, their corresponding *p*-values and overall R^2 values.

RESULTS

A total of 580 teachers participated in the study. Six hundred sixty-five completed the questionnaires giving a response rate of 97.4%. Those who did not completely fill out the questionnaire (*n*=15) were those who did not respond to the question about income.

Table 1 describes the demographic characteristics of the study population. The mean age was 40.5 years (SD=6.41) with 404 female teachers (69.7%). Five hundred forty (93.1%) teachers were Malay, 544 were married

Table 1
Socio-demographic characteristics of 580 secondary school teachers in Kota Bharu.

Variable	Mean (SD)	Median (IQR)	*n* (%)
Age (years)	40.5 (6.41)		
Gender			
Male			176 (30.3)
Female			404 (69.7)
Race			
Malay			540 (93.1)
Chinese			36 (6.2)
Indian			2 (0.3)
Siamese			2 (0.3)
Marital status			
Married			544 (93.8)
Single/Divorce			36 (6.2)
Educational status			
SPM/STPM			13 (2.3)
Diploma			29 (5.0)
Bachelor degree			506 (87.2)
Master's degree			32 (5.5)
[a]Household Income (RM)	2,736.4 (831.6)		
Duration of work (years)		11.0 (7.0,16.0)	
Number of children	4 (2)		
Smoking status			
Yes			38 (6.6)
No			542 (93.4)

[a] 15 teachers did not respond on the question of household income

Table 2

Job characteristics of 580 secondary school teachers in Kota Bharu, Malaysia.

Variable	Mean (SD)	n (%)
Type of school		
Urban		375 (64.7)
Rural		205 (35.3)
Committee member		
Yes		351 (60.5)
No		229 (39.5)
Number of classes	4.7 (1.6)	
Skill discretion	35.4 (3.6)	
Decision authority	14.4 (2.4)	
Decision latitude	49.8 (4.1)	
Psychological job demand	33.7 (4.2)	
Job insecurity	5.2 (1.9)	
Coworker support	12.3 (1.3)	
Supervisor support	11.7 (2.2)	
Social support	23.9 (2.8)	
Physical exertion	2.8 (0.7)	
Hazardous conditions	0.9 (1.5)	

Table 3

Prevalence of stress among 580 secondary school teachers in Kota Bharu, Malaysia.

Stress level	n (%)
Normal	383 (66.0)
Mild	101 (17.4)
Moderate	47 (8.1)
Severe	29 (5.1)
Extremely severe	20 (3.4)
Total	580 (100.0)

(93.8%). Five hundred six (87.2%) had a degree level of education and 542 (93.4%) teachers did not smoke. The median duration of work was 11.0 years. The mean household income and number of children were RM 2,736.4 (SD=RM 831.6) and 4 (SD=2), respectively.

Table 2 shows the job characteristics of the secondary school teachers in Kota Bharu.

Three hundred seventy-five (64.7%) teachers taught in urban schools and 351 (60.5%) of them were members of a teachers' union. The mean number of classes taught by the teachers was 4.7 (SD=1.6).

The number of teachers who had mild to extremely severe stress levels was 197, giving a prevalence of stress among secondary school teachers of 34.0% (30.1, 37.8). One hundred one teachers (17.4%) had a mild level of stress (Table 3).

Simple linear regression analysis of 8 socio-demographic characteristics and 10 job characteristics in the 580 secondary school teachers showed psychological job demand (p=0.037) was significantly associated with stress. Multiple linear regression analysis showed age (p=0.002), work duration (p=0.002) and psychological job demands (p=0.027) were significantly associated with stress (Table 4).

The regression coefficient (b) was applied to predict stress scores using multiple linear regression equation $y = a + bx$; $y = b_0 + b_1 x_1 + b_2 x_2 + ... + b_n x_n$ where the regression coefficient (b) is the variation in value of the outcome (y) when independent variable (x) is increased by one unit. Using the regression equation resulting from linear regression analysis, "b" was used in interpreting the effect of independent "x" on outcome "y".

For the age variable, one teacher 10 years older than another teacher would have a higher level of stress by 4 points. This explains why b = 0.39 (95% CI -0.65-0.14) meaning a teacher who is one year old will have a 0.39 points increase in stress. Therefore, a teacher who is 10 years older (10 . 0.39 = 3.9 ~ 4.0), will have stress score 4 points higher.

Similarly, a teacher with 10 years greater work experience had a higher level of stress by 3.8 points (One year more experience has

Table 4

Job and non-job factors associated with stress among 580 secondary school teachers in Kota Bharu, Malaysia.

Independent variable	SLR[a]				MLR[b]			
	b[c]	(95% CI)	t Stat. (df)	p-value	b[d]	(95% CI)	t Stat.	p-value
Age	-0.055	(0.163, 0.053)	-1.00 (578)	0.317	-0.398	(-0.651, -0.145)	-3.09	**0.002**
Gender	1.125	(-0.373, 2.623)	1.48 (578)	0.141				
Marital status	2.558	(-0.294, 5.410)	1.76 (578)	0.079				
Educational status	0.387	(-4.274, 5.048)	0.16 (578)	0.871				
Household income	<0.001	(-0.001, 0.001)	-0.61 (578)	0.540				
Duration of work	0.016	(-0.088, 0.120)	0.30 (578)	0.760	0.378	(0.134, 0.622)	3.04	**0.002**
Number of children	0.118	(-0.211, 0.448)	0.70 (578)	0.481				
Smoking status	0.487	(-2.301, 3.275)	0.34 (578)	0.732				
Type of school	0.712	(-0.731, 2.154)	0.97 (578)	0.333				
Committee member	-0.586	(-1.997, 0.825)	-0.82 (578)	0.415				
Number of classes	0.152	(-0.292, 0.596)	0.67 (578)	0.502				
Decision latitude	-0.094	(-0.264, 0.076)	-1.09 (578)	0.276				
Psychological job demand (PJD)	0.174	(0.010, 0.337)	2.09 (578)	**0.037**	0.184	(0.021, 0.346)	2.22	**0.027**
Job insecurity (JI)	0.312	(-0.053, 0.677)	1.68 (578)	0.094				
Coworker support	-0.167	(-0.690, 0.356)	-0.63 (578)	0.531				
Supervisor support	<0.001	(-0.318, 0.318)	0.00 (578)	0.999				
Physical exertion	-0.252	(-1.257, 0.753)	-0.49 (578)	0.623				
Hazardous condition	0.171	(-0.291, 0.634)	0.73 (578)	0.467				

[a] Simple linear regression

[b] Multiple linear regression (The model reasonably fits; model assumptions were met; there were no multicollinearity problem or interactions between independent variables)

[c] Crude regression coefficient

[d] Adjusted regression coefficient

$R^2 = 0.03$

b = 0.38 (95% CI 0.13-0.62). Therefore, a teacher with 10 years more experience had a higher stress level by 3.8 points. A teacher with a score 10 points higher in psychological job demand, had higher stress level by 1.8 points. One point higher in psychological job demand, b = 0.18 (95% CI 0.02 - 0.35) resulted 1.8 points higher in stress levels).

On the linear regression model, age, years of work experience and psychological demand explained 3% variation in stress level (R^2=0.03). The rest of the 97% variation in stress score was explained by other variables which were not in the final model.

DISCUSSION

The prevalence of stress ranging from mild to extremely severe, was 34.0% (95% CI 30.1, 37.8) in secondary school teachers in Kota Bharu, Kelantan, Malaysia. However, the majority of teachers had a mild level of stress (17.4%).

These findings show the teaching profession is mildly stressful. These findings are similar to a study by Mokhtar (1998) of secondary school teachers in one of the districts in Kedah, Malaysia. He reported 17.5% had high levels, 66% moderate levels and 16.5% mild levels of stress.

Hanizah (2003) studied the levels of stress among secondary school teachers and found the prevalence of stress among teachers was 55.7%. The high prevalence was due to the working environment of the teachers, where all the teachers were using information technology whereas our study was of government-aided teachers. Noor Suhaida (2002) found the level of stress among rural and urban secondary school teachers was mild.

A report of occupational stress in the year 2000 found the occupations in the United Kingdom with high stress (in order) were teaching, nursing, management, professionals, other education, welfare, road transport and security. At least one in five reported high levels of stress. The teachers who reported high levels of stress were two in five (Health and Safety Executive, 2000b).

Emotional health among secondary school teachers in Kota Bharu is worrisome. This problem should be addressed in order to maintain the integrity of educational, which is important in developing a productive and educated nation.

The level of job stress is expected to correspond closely to the country's economic development. Higher job stress is observed in subjects from countries with a lower degree of economic development, such as in Kota Bharu, more so than in other states. Apart from methodological differences from other studies, the lower levels of stress may be explained by a tendency of Malay people to overlook their psychological problems.

In this study, younger teachers had more stress than the older teachers. This finding corresponds with a study by Noor Suhaida (2002) of secondary school teachers in Terengganu and Selangor. She found teachers between the age of 31 and 40 years old had high stress levels. At this age, the subjects may have other requirements to fulfill, such as family life and financial needs.

In a survey of English teachers in British Columbia (BCTF, 2001) respondents were asked whether they experienced stress and how effectively they were able to cope with these symptoms. When asked about "Loss of Time for Family or Friends", almost 89% of teachers in their 20s and 30s said "Yes" while about 82% of teachers in their 50s answered "Yes" and 73% of teachers in their 60s answered "Yes". When asked about the "Loss of Personal Interest or Hobby Time", almost 90% of subjects in their 20s and 30s answered "Yes" compared to 10% fewer

teachers in their 50s or 60s. It appeares clear that the youngest teachers fare worse in terms of stress and its impact.

Antoniou *et al* (2006) found that younger and older teachers perceived stress at work differently. Younger teachers experienced higher levels of burnout, specifically in terms of emotional exhaustion and disengagement from the profession, while older teachers experienced higher levels of stress in terms of the support they feel they received from the government.

Contrary to the findings of the BCTF (2001) where less-experienced, younger teachers reported both more stress and lesser ability to cope with it than their older and more experienced colleagues, our study found more experienced teachers were worse at coping with stress.

Teachers with more experience are often selected to become "expert teachers" (Federal Congregation of School Inspectors, 1995), meaning they are chosen by the ministry to be an expert in certain subjects. They become a referral teacher for that particular subject both for students and other teachers. Expert teachers give out their opinions, determine the strengths and weaknesses of the education system, give training to other colleagues and become consultants in the subjects they teach. The multiple roles played by expert teachers can lead to high levels of stress.

However, Shafee (2002) found teachers who were in service for more than 5 years were highly satisfied (in relation with task, colleagues, supervision and teaching environment). This is because of developing a good long relationship between the teacher and his or her colleagues and adapting to the educational curriculum.

In this study, the psychological job demands were significantly associated with stress level. Rozihaya (1998) revealed a significant relationship between stress and workload. There is an increasing demand for work to be completed within a limited time, therefore, time constraints are a major factor contributing to stress among teachers. Nor Salmi (2002) found "not enough time to finish up the syllabus", especially in those who taught exam classes, was one important factor causing stress among teachers.

NSW/ACT IEU (2002) conducted research projects into workloads and perceptions of occupational stress among teachers employed in Catholic and Independent schools in Victoria and New South Wales (NSW), Australia, respectively. The study showed there were four major areas perceived to be of particular concern as stressors: workload pressures, demands of professionalism, communications/management and career prospects. Regarding workload pressure, 85.1% of Victorian and 91.9% of the NSW teacher subjects recorded either "high" or "moderate" levels of stress deriving from the multiplicity of tasks to be performed by the teacher given the time constraints; 75.9% of the Victoria and 86.2% of the NSW subjects reported "high" or "moderate" stress levels ensuing from the constancy of the work effort.

In our study, the R^2 for stress analysis was low. This means job factors do not contribute much to stress among secondary school teachers. Other non-job related factors, such as personal, social, health, technology and financial factors, which were not covered in this study, might be the main contributory factors towards stress levels among the teachers in our study.

Personal factors, such as the emotions of the teachers, can be reasons for having stress among teachers. Teachers in Hong Kong have found teaching to be more and more stressful and suggest job stress has eroded their sense of excitement in pursuing a teaching career. Some reported having feelings of being emotionally drained, had

expressed negative attitudes in responding to students, and did not value their own achievements (Chan, 2006).

Our study has some limitations. First, the cross-sectional nature of this study limits our capacity to demonstrate a cause effect relationship between individual and occupational variables and stress level. Second, we did not take into account all the characteristics of the working environment that could have introduced a source of potential bias (especially working hours, subjects taught and working position). Third, the study was performed with participants from a single occupation rather than evaluating and comparing various occupational groups. School teachers generally have similar responsibilities. This means differences in job demands and job control are more a reflection of individual perception of the work situation than in studies where persons from different occupations are included. A reason for taking this approach is that professions differing in social status, physical activity and other factors may influence stress level. The results can not be generalized to other populations. DASS is not meant for diagnosis according to discrete diagnostic categories postulated in classificatory systems, such as the DSM IV and ICD 10. DASS is based on a dimensional rather than a categorical concept of a psychological disorder. However, they evaluate the same entity with different methods of measurement.

The average stress level among secondary school teachers in Kota Bharu was mild. However, based on the overall prevalence of stress, it still poses a risk to teachers' health and well being. The factors significantly associated with stress were age, duration of work and psychological job demands.

The subjective characteristics related to working conditions had more influence on the subjects' emotional health than the objective characteristics. This shows that job factors did not contribute much to stress among secondary school teachers.

Other non-job related factors, such as personal, social, technology and financial factors which were not covered in this study, should be looked into, in order to determine the main contributory factors towards stress level among secondary school teachers.

The findings of this study provide information regarding the magnitude of the problem among secondary school teachers in Kota Bharu. They point toward a need to further explore the underlying reasons or factors leading to stress. This suggests possible weaknesses in our existing teaching services as well as measures that improve them.

A number of the results of the present study are important for the potential they have in terms of public health and policy implications, especially because some easy to implement measures to change conditions or behavior at work could help improve some of the problems identified. Better information for teachers and adjusting their training could improve teacher behavior, which could have an impact on the occurrence of emotional health problems, such as stress. Evaluation of some areas, such as adopting new teaching strategies, official hours of duty and levels of extra-curricular involvement, could provide a better regulatory framework within which education staff would be able to find solutions to some of their problems. Other interventions, such as stress management, can be carried out to improve the workplace. Intervention regarding non-job factors (*eg,* counseling) should not be left out since these were the major cause of stress in teachers in our study.

This study only evaluated the level of stress among secondary school teachers. It would be helpful to compare primary and

secondary school teachers to determine which group has more psychological stress. Other factors may also affect the emotional health status of teachers. We recommend other factors be considered, such as personality and technology use, in order to get a true picture of factors associated with the emotional health of teachers. Most critical is the need for prospective investigations to evaluate causality.

In our study, the R^2 for stress analysis was low, thus job factors did not contribute much to stress among secondary school teachers. Other factors, such as personal, social, technological and financial factors which were not being covered in this study, should be looked into more deeply in order to obtain the main contributory factors towards stress among teachers.

ACKNOWLEDGEMENTS

REFERENCES

Antoniou AS, Polychroni F, Vlachakis AN. Gender and age differences in occupational stress and professional burnout between primary and high-school teachers in Greece. *J Manage Psychol* 2006; 21: 682-90.

Antony MM, Bieling PJ, Cox BJ, Enns MW, Swinson RP. Psychometric properties of the 42-item and 21-item versions of the Depression Anxiety Stress Scales (DASS) in clinical groups and a community sample. *Psycholog Assess* 1998; 10: 176-81.

Azlihanis AH, Nyi NN, Aziah BD, Rusli BN. Reliability and construct validity of the Malay version of the Job Content Questionnaire (JCQ) among secondary school teachers in Kota Bharu, Kelantan, Malaysia. *Southeast Asian J Trop Med Public Health* 2006; 37: 1254-59.

Borg MG, Riding RJ, Falzon JM. Stress in teaching: a study of occupational stress and its determinants among primary school teachers. *Br J Educ Psychol* 1991; 11: 59-75.

Boyle GJ, Borg MG, Falzon JM, Baglioni AJ. A structural model of the dimensions of teacher stress. *Br J Educ Psychol* 1995; 65: 49-67.

British Columbia Teacher Federation (BCTF). Teacher workload and stress: an international perspective on human costs and systemic failure. *Research Report* 2001; Section III, WLC-01. [Cited 2006 Jan 24]. Available from: URL: http://www.bctf.ca/ResearchReports /2001wlc01/report.html

Brown TA, Chorpita BF, Korotitscw K, Barlow DH. Psychometric properties of the Depression Anxiety Stress Scales (DASS) in clinical samples. *Behav Res Ther* 1996; 35: 79-89.

Chan DW. Emotional intelligence and components of burnout among Chinese secondary school teachers in Hong Kong. *Teaching Teacher Educ* 2006; 22: 1042-54.

Chan DW, Hui EKP. Burnout and coping among Chinese secondary school teachers in Hong Kong. *Br J Educ Psychol* 1995; 65: 15-25.

Dorman, J. Testing a model for teacher burnout. *Aust J Educ Develop Psychol* 2003; 3: 35-47.

Federal Congregation of School Inspectors, Ministry of Education. Annual report 1995: 80.

Hanizah MY. The effect of information technology usage on the prevalence of stress among school teachers in Selangor and factors affecting the stress. Kuala Lumpur: Universiti Kebangsaan Malaysia, 2003. 110 pp. Master thesis.

Harmy MY. A comparative study of job stress in nurses in Hospital Universiti Sains Malaysia and clerical workers in Kota Bharu district in Kelantan. Kubang Kerian: Universiti Sains Malaysia, 2001. 107 pp. Master thesis.

Health and Safety Executive. Stress at work: Who is affected most? Press release E 246:00, 2000a.

Health and Safety Executive. The scale of occupational stress: A further analysis of the impact of demographic factors and type of job. 2000b. [Cited 2006 Jan 24]. Available from: URL: http://www.hse.gov.uk/research/crr_pdf/2000/crr00311.pdf

Henry JD, Crawford JR. The short-form version of the Depression Anxiety Stress Scales (DASS-21): construct validity and normative data in a large non-clinical sample. *Br J Clin Psychol* 2005; 44: 227-39.

Ismail O. Work perception and its relationship with work stress: A study on mathematics and science teachers in Kota Bharu, Kelantan. Kuala Lumpur: Universiti Kebangsaan Malaysia, 1998. 105 pp. Master thesis.

Kyriacou C. Teacher stress: directions for future research. *Educ Rev* 2001; 53: 27-35.

Lovibond PF, Lovibond SH. Manual for the depression, Anxiety and Stress Scales. Sydney: Psychology Foundation, 1995.

Mokhtar A. Work stress among secondary school teachers: A study in Kulim-Bandar Bahru, Kedah, Darul Aman. Kota Samarahan: Universiti Malaysia Sarawak, 1998. 102 pp. Master thesis.

Noor Suhaida S. Work stress and associated factors among urban and rural secondary school teachers. Serdang: Universiti Putra Malaysia, 2002. 97 pp. Master thesis.

Nor Salmi L. Occupational stress among secondary school teachers in Tumpat, Kelantan, Malaysia. Serdang: Universiti Utara Malaysia, 2002. 112 pp. Master thesis.

NSW/ACT Independent Education Union. Stress! Burnout! Among Teachers 2002. [Cited 2006 Feb 24]. Available from: URL: http://www.ieu.asn.au/ohs/stressburnout.html

Okebukola PA, Jegede OJ. Determinants of occupational stress among teachers in Nigeria. *J Educ Stud* 1989; 15: 23-36.

Pithers RT, Forgaty GJ. Occupational stress among vocational teachers. *Br J Educ Psychol* 1995; 65: 3-14.

Rozihaya Y. Organizational factors that contribute to teacher stress. Kubang Kerian: Universiti Sains Malaysia, 1998. 102 pp. Master thesis.

Shafee H. Is duration of service has any relationship with level of job satisfaction: study in Tanjung Rambutan and Ipoh, Perak, Malaysia. Kuala Lumpur: Universiti Kebangsaan Malaysia, 2002. 115 pp. Master thesis.

Vandenberghe R, Huberman M, eds. Understanding and preventing teacher burnout: a sourcebook of international research and practice. Cambridge: Cambridge University Press, 1999.