Prevalence and Associated Factors of Job-Related Depression in Laboratory Technicians in Hospital Universiti Sains Malaysia (HUSM) and Ministry of Health Malaysia (MOH) Hospitals in Kelantan

B D Aziah, MD*, B N Rusli, PhD*, **, T Winn, DrPH *, L Naing, MMedStat *, **, M A Tengku, MSc (PH)*

*Department of Community Medicine, School of Medical Sciences, **School of Dental Sciences, Universiti Sains Malaysia, Health Campus, 16150 Kubang Kerian, Kelantan

Summary

Karasek's job strain model postulates that workers chronically exposed to adverse psychosocial work environment (high strain job) – high psychological job demands and low job control, including poor social support, increased physical demand and hazardous work condition – will eventually develop both physical illnesses such as cardiovascular diseases and psychological disorders such as depression. In order to determine the prevalence and associated factors of job-related depression, a cross-sectional study was conducted among laboratory technicians in Hospital Universiti Sains Malaysia (HUSM) and Kementerian Kesihatan Malaysia (KKM) Hospitals in Kelantan between September 2001 and February 2002. One hundred and two laboratory technicians in HUSM and 79 laboratory technicians in 7 KKM Hospitals were selected; 84/102 (82.4%) in HUSM and 71/79 (89.9%) in KKM Hospitals responded. Data was collected using self-administered questionnaires of the validated Malay version of the Job Content Questionnaire (JCQ) originally developed by Robert Karasek. Results indicated that the prevalence of high job strain in laboratory technicians in HUSM and KKM hospitals was 33.3% (28/84) and 26.8% (19/71), respectively (p>0.05). Significantly higher proportion (59.5%) (50/84) of laboratory technicians in HUSM compared to those in KKM Hospitals (39.4%) (28/71) (p = 0.016) experienced job-related depression. Significant associated factors of job-related depression were low social support (HUSM: adjusted OR 4.7, 95% CI 1.2-18.8; KKM: adjusted OR 14.8, 95%CI 2.4-89.3), high psychological demand (HUSM: adjusted OR 3.0, 95%CI 1.0-8.8), and low decision authority (KKM: adjusted OR 9.7, 95%CI 1.0-91.1). We conclude that strengthening the social support network (supervisors' and coworkers' support), reducing psychological job demand, and increasing decision-making authority of laboratory technicians may go a long way towards reducing job-related depression.

Key Words: Job-related depression, Laboratory technicians, HUSM, KKM Hospitals, Karasek's Job Content Questionnaire, Job Strain Model

Introduction

Work-related depression is a clinical illness and workers should take this seriously[1]. Depressed and stressed individuals had 70% and 46% higher health expenditures, respectively, than their healthier counterparts in a study that examined over 46,000 employees over a 3-year period[2]. Therefore, in an organizational climate that promotes the development of emotions such as anger and depression, the results

can be devastating for the health of the company and the individual workers who experience the negative effect.

Depressed workers have between 1.5 and 3.2 short-term disability days more than other workers, with a salary equivalent to productivity loss averaging between $182 and $395[3]. Trends in occupational health psychology also suggest that stress and depression are increasing[4]. There is a relationship between job stress and depression among workers that could directly influence worker satisfaction[5].

Organizations rely on a workforce that can be innovative, creative, and committed to the tasks they are responsible to complete. These creative and innovative contributions can be stymied if the individual's mind is clouded with maladaptive stress, anger, and depression. These emotions can deter the worker from making the contributions necessary to help the organization succeed or provide its services[6].

In Japan, Japanese workers paid for their frantic work rate with an epidemic of karoshi, i.e. death from heart disease or stroke caused by overwork[7]. The proportion of workers in Japan who had great anxiety or perceived their job as difficult or stressful has increased from 51% in 1982, 57% in 1992 and 63% in 1997[8]. The workplace today is therefore widely thought to be more emotionally and mentally stressful than the typical workplace hitherto. A deadly companion to *karoshi*, also caused by overwork, has recently been recognized in Japan – karojisatsu, work-related depression leading to suicide. Both private and public sector cases have been formally recognized[7].

At the moment, very few epidemiological studies have been conducted to examine the effects of job stress on job-related depression among Malaysian workers. In Malaysia, we has no figures to assess the loss due to job stress but the number of work-related diseases is increasing; however, the Ministry of Health Malaysia still believes that there is serious under reporting[9]. The purpose of this study was therefore to determine the prevalence of high job strain and job-related depression and associated factors in laboratory technicians in Hospital Universiti Sains Malaysia (HUSM) and Kementerian Kesihatan Malaysia (KKM) Hospitals in Kelantan.

Materials and Methods

Study Design
A cross-sectional study was designed to determine the prevalence of high job strain and job-related depression and associated factors in laboratory technicians in HUSM and KKM Hospitals in Kelantan.

Sample Size
Sample size calculation was based on the 13% prevalence of work-related depression in employees who were involved in the Health Promotion Program at the worksite located in the northeastern United States[4]. The power of the study was decided at 80% with an _- value of 0.05. The calculated sample size, based on two proportions, was 50 for each group (laboratory technicians in HUSM and KKM Hospitals). We recruited 84 out of 102 (response rate 82.4%) laboratory technicians in HUSM and 71 out of 79 (response rate 89.9%) in 7 KKM Hospitals.

Recruitment of Study Subjects
We developed specific inclusion and exclusion criteria for our study subjects. The inclusion criteria include (a) age between 18 to 55 years old, and (b) holding grade U8 posts. The reason for choosing grade U8 posts was that the majority of laboratory technicians were categorized under this grade. The exclusion criteria include a diagnosis of any psychiatric illness.

Research Protocol
The research protocol was reviewed and approved by the Research and Ethics Committee, School of Medical Sciences, Universiti Sains Malaysia, Kelantan Health Campus. The study was conducted in the laboratories in HUSM and in 7 KKM Hospitals (Kota Bharu, Pasir Mas, Pasir Puteh, Tanah Merah, Machang, Tumpat, and Kuala Krai) in Kelantan between June 2001 and February 2002. Data was collected using validated self-administered Job Content Questionnaires (JCQ) originally developed by Robert Karasek[10, 11]; we pre-tested the JCQ using the local Malaysian language.

Research Instrument
The research instrument is the JCQ[10, 11] that has been translated into Malay and back translated into English and validated in an earlier study[12]. The JCQ is a questionnaire-based instrument designed to measure the content of a work task. JCQ contains five scales: psychological demand (job demand), decision latitude (job control), social support, physical demand, and job insecurity. A job demand can be described as a

psychological stressor in the work environment, such as having to complete much work and working under time pressure. Job control consists of two components namely "decision authority" (opportunity to make decisions concerning the job) and "skill discretion" (amount of skills used in the job). Social support also consists of two components – co-worker's and supervisor's support. Physical demand is measured by the physical effort necessary to accomplish the task while job insecurity is measured by job steadiness, job security, and future layoff. Figure 1 summarizes the four job conditions that might result from different combinations of job demand and job control – active, passive, low strain, and high strain – according to Karasek's job strain model[10, 11]. The measure of depression used is a set of 8 questions (section II - questions R1-R8) that operationalizes the criteria for depression as outlined in the "Job Content Questionnaire and User's Guide" by Karasek[11] and these measures can be used to estimate the prevalence of job-related depression. The questions are presented in Appendix 1.

Statistical Analysis
Data entry and analysis was done using the Statistical Program for Social Science (SPSS) Version 10.0[13]. Means ± standard deviations (SD) for continuous variables and frequencies and percentages for categorical variables were calculated for socio-demographic characteristics and occupational characteristics. Independent t-test was used to compare the mean difference for continuous and chi square test for categorical data with level of statistical significance set at 0.05. Depression was treated as a dichotomous binary outcome - those above the median were considered depressed and below the median as non-depressed. The chi-square test was used to compare the prevalence of depression between laboratory technicians in HUSM and KKM Hospitals. The association between depression and socio-demographic characteristics and psychosocial job factors were examined by multiple logistic regressions for both HUSM and KKM Hospitals. The level of significance was set at a p value of less than 0.05. All analyses were carried out in the Department of Community Medicine, School of Medical Sciences, Universiti Sains Malaysia, Kelantan Health Campus, Malaysia.

Results

Socio-demographic characteristics of 84 laboratory technicians in HUSM and 71 in KKM Hospitals are

shown in Table I. Laboratory technicians in HUSM were generally younger (mean age 31.7, SD 9.0 years) compared to those in KKM Hospitals (mean age 41.7, SD 6.2 years). Laboratory technicians in KKM Hospitals had significantly more children (mean 2.9, SD 2.3) compared with those in HUSM (mean 1.5, SD 1.9). There were also significant differences between laboratory technicians in HUSM and KKM Hospitals with respect to ethnic group, marital status and educational level.

Table II shows the occupational characteristics of 84 laboratory technicians in HUSM and 71 in KKM Hospitals. Laboratory technicians in KKM Hospitals had significantly longer average duration of work per week, duration of employment, and total duration of employment (53.1 hours, 152.8 months, and 18.1 years, respectively) compared with those in HUSM (45.5 hours, 100.1 months, and 9.7 years, respectively). A higher proportion of laboratory technicians in KKM Hospitals were union members (62/71) (87.3%) and always using computer or automated machines (47/71) (67.1%) compared with those in HUSM [55/84 (65.5%) and 43/84 (51.2%), respectively].

The prevalence of job strain in laboratory technicians in HUSM and KKM Hospitals is shown in Table III. Majority of laboratory technicians in HUSM and KKM Hospitals were classified under the passive group [31/84 (36.9%) and 21/71 (29.6%), respectively]. A significantly higher proportion (28/84) (33.3%) of laboratory technicians in HUSM belongs to the high strain group compared with those in KKM Hospitals (19/71) (26.8%). However, these differences were not statistically significant (p>0.05).

Table IV shows the prevalence of depression in 84 laboratory technicians in HUSM and 71 in KKM Hospitals. A higher proportion (50/84) (59.5%) of laboratory technicians in HUSM experienced depression compared to those in KKM Hospitals (28/71) (39.4%). The difference is statistically significant (p=0.016).

Table V shows the results of multiple logistic regression analysis of depression in 84 laboratory technicians in HUSM. The odds of having job-related depression for high psychological demand was 3.0 times higher (adjusted OR 3.0, 95% CI 1.1–8.8) than low psychological demand and low social support was 4.7 times higher (adjusted OR 4.7, 95% CI 1.2–18.8) than high social support.

Table VI shows that the odds of having job-related depression for low decision authority was 9.7 times higher than high decision authority (adjusted OR 9.7, 95% CI 1.1 – 91.1) and low social support was 14.8 times higher than high social support (adjusted OR 14.8, 95% CI 2.4 – 89.3) in 71 laboratory technicians in KKM Hospitals. However, there was no association between hazardous condition and job-related depression although hazardous condition was included in the final model.

The final models of associated factors of depression in laboratory technicians in HUSM and KKM Hospitals using multiple logistic regressions were checked for fitness using Hosmer-Lemeshow's goodness-of-fit test. The p values were not significant, thus the models were fit. The main effects of the models were also checked for interactions by using 2-way interaction tests, which were found to be non-significant, thus confirming that there were no significant interactions between each variable in the final models.

Table I: Socio-demographic characteristics of 84 laboratory technicians in HUSM and 71 in KKM hospitals

Variables	Hospital				Difference (p value)[a]
	HUSM		KKM		
	Mean (SD)	No. (%)	Mean (SD)	No. (%)	
Age (yr)	31.7 (9.0)		41.7 (6.2)		< 0.001
No. of children	1.5 (1.9)		2.9 (2.3)		< 0.001
Income per month (RM)	1510.9 (406.5)		1558.4 (275.5)		NS b
Sex					
Male		38(45.2)		37(52.1)	NS
Female		46(54.8)		34(47.9)	
Ethnic group					
Malay		69(82.1)		66(93.0)	< 0.05
Non- Malay c		15(17.9)		5(7.0)	
Marital status					
Married		54(64.3)		69(97.2)	< 0.001
Single/divorce		30(35.7)		2(2.8)	
Education level					
Tertiary		82(97.6)		31(43.7)	< 0.001
Non-Tertiaryd		2(2.4)		40(56.3)	
Smoking status					
Yes		12(14.3)		14(19.7)	NS
No		72(85.7)		57(80.3)	

[a] Significant for group difference (Independent t-test for age, no. of children, and income per month; χ^2 for all others)
[b] NS: Not Significant, p > 0.05
[c] Chinese, Indian and Siamese.
[d] Primary School, Lower & Upper Secondary School.

Table II: Occupational characteristics of 84 laboratory technicians in HUSM and 71 in KKM hospitals

Variables	Hospital				Difference (p value)[a]
	HUSM		KKM		
	Mean (SD)	No. (%)	Mean (SD)	No. (%)	
Average hours of work per week	45.5 (14.0)		53.1 (17.2)		< 0.01
Duration of employment (month)	100.1 (91.8)		152.8 (90.4)		< 0.001
Total duration of employment (year)[b]	9.7 (8.8)		18.1 (6.9)		< 0.001
Union member					
Yes		55(65.5)		62(87.3)	< 0.01
No		29(34.5)		9(12.7)	
Shift work					
Yes		11(13.1)		18(25.4)	NSc
No		73(86.9)		53(74.6)	
Using computer or automated machines					
Not at all		8 (9.5)		1 (0.1)	< 0.01
Occasionally		15(17.9)		8(11.4)	
Often		18(21.4)		15(21.4)	
Always		43(51.2)		47(67.1)	

[a] Significant for group difference (Independent t-test for average duration of work per week, duration of employment, and total duration of employment; χ^2 for all others)
[b] Including previous job
[c] NS: Not Significant, p > 0.05

Table III: Prevalence of job strain in 84 laboratory technicians in HUSM and 71 in KKM hospitals

Job Strain Categories	Hospital				Differences (p value)[a]
	HUSM		KKM		
	No.	%	No.	%	
Low Strain	15	17.9	17	23.9	NS[b]
Passive	31	36.9	21	29.6	
Active	10	11.9	14	19.7	
High Strain	28	33.3	19	26.8	
Total	84	100.0	71	100.0	

[a] Significance for group difference: χ^2 was used to test the difference across the hospitals
[b] NS: Not Significant, p > 0.05

Table IV: Prevalence of depression in 84 laboratory technicians in HUSM and 71 in KKM hospitals

Variables	Hospital				p value[a]
	HUSM		KKM		
	No.	%	No.	%	
Depression					
Yes	50	59.5	28	39.4	0.016
No	34	40.5	43	60.6	

[a] χ^2 – test

Table V: Associated factors of depression in 84 laboratory technicians in HUSM: multiple logistic regression analysis
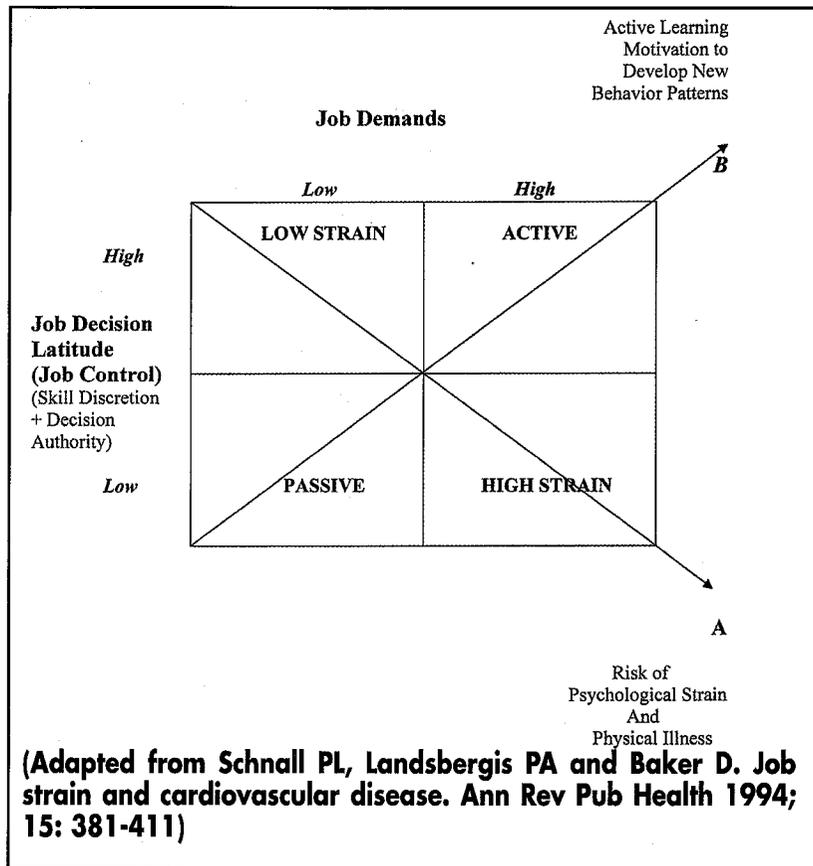
Factors	Crude Odds Ratio[a]	Adjusted Odds Ratio[b]	95% Confidence Interval	p value[c]
Psychological Demand				
Low	1.0	1.0		
High	1.9	3.0	1.0 – 8.8	0.047
Social Support				
High	1.0	1.0		
Moderate	1.4	3.6	1.0 – 12.9	0.050
Low	2.6	4.7	1.2 – 18.8	0.027

[a]Simple logistic regression.
[b]Multiple logistic regression adjusted for age, sex, ethnic group, marital status, educational level, and income per month.
[c]Likelihood-Ratio test, $\alpha < 0.05$.

Table VI: Associated factors of depression in 71 laboratory technicians in KKM hospitals: multiple logistic regression analysis

Factors	Crude Odds Ratio[a]	Adjusted Odds Ratio[b]	95% Confidence Interval	p value[c]
Decision Authority				
High	1.0	1.0	1.0 – 91.1	0.048
Low	4.5	9.7		
Social Support				
High	1.0	1.0		
Moderate	9.8	10.7	2.0 – 59.0	0.006
Low	18.0	14.8	2.4 – 89.3	0.003
Hazardous Condition				
Low	1.0	1.0		
High	2.5	3.2	0.9 – 10.2	0.054

[a]Simple logistic regression.
[b]Multiple logistic regression adjusted for age, sex, ethnic group, marital status, educational level, and income per month.
[c]Likelihood-Ratio test, $\alpha < 0.05$.

Figure 1. Karasek's Job Strain Model

(Adapted from Schnall PL, Landsbergis PA and Baker D. Job strain and cardiovascular disease. Ann Rev Pub Health 1994; 15: 381-411)

Discussion

Karasek et al.[14] have found that stressful job conditions were associated with impaired health. According to their research, the most stressful set of job conditions combines a low level of decision latitude (job control) – for example, having little control over the pacing of tasks or the allocation of resources – and having a high psychologically demanding task, such as those that have time pressures, dead-lines, large workloads, and conflicting or heavy emotional demands. This "high-strain" combination is related to elevated risk for such negative health outcomes as coronary heart disease and depression. Presumably the high level of demand creates arousal, and the inability to exert control leads to frustration.

Mausner-Dorsch and Eaton[15] also found that high job strain was associated with greater prevalence of all forms of depression. They were able to evaluate the relation between occupational strain and depression with population-based data instead of with data from clinical or other selected populations. The results also confirm the importance of the demand-control model for depression by providing a theoretical framework to explain the relation between the psychosocial characteristics of the work environment and depression as a health outcome. In studying the relationship between the individual and work, special attention is usually given to job conditions - job characteristics, work surroundings - and organization of work, that are often difficult to change. This is because it is technically, economically, and politically difficult, in practice, to influence the organization of work and to alter job conditions. The term job conditions are physical job conditions (e.g., noise, temperature, lighting), chemical conditions (e.g., vapor, dust), and biological conditions (e.g., bacteria, viruses). The term

organization of work means the division of labor, mode of operation and work pace, and the way in which each worker is assigned a place and function. The organization of work conflicts with the psychological functioning of the individual at every point, and it can be understood that depressive states may arise from the mode of organization of work. Clinical investigations have effectively demonstrated that assembly-line workers did not experience the same type of depression as office workers[16]. Furthermore, Hammen[17] has proposed that certain individuals may be particularly vulnerable to some stressors more than others.

We found that significantly higher proportion (50/84) (59.5%) of laboratory technicians in HUSM experienced job-related depression than those in KKM Hospitals (28/71) (39.4%). Based on Karasek's job strain model[10, 14], the difference could be explained by possibly higher prevalence of job strain in laboratory technicians working in HUSM as compared to those working in KKM hospitals. The job strain model postulates that high strain workers would invariably experience adverse physical and psychological events such as ischemic heart diseases and depression, respectively.

In the present study, we found that the common associated factor for job-related depression in laboratory technicians in HUSM (adjusted OR 4.7, 95% CI 1.2-18.8) and KKM Hospitals (adjusted OR 14.8, 95% CI 2.4-89.3) was *low social support*. Lack of social support contributes towards the development of job strain because opportunities to benefit from the positive (healthy) social contacts are reduced. Particularly with regard to 'people's work', which often implies intensive emotional experiences, social support from colleagues and superiors may help workers to cope effectively with these experiences. A recent meta-analytic study by Janssen et al.[18] provides evidence for the relationship between demands (workload) and lack of resources (limited social support) on the one hand, and emotional distress on the other.

Social support from colleagues and supervisors can be very helpful in reducing and preventing emotional distress. A study has shown that workers deprived of supportive intimate relationships with others are significantly more likely to develop depression[19]. Investigators have also found that depressed people have fewer supportive relationships and that depressed persons perceive less support from the relationship that they do have[17]. As Blazer et al.[20] have speculated, depressed individuals may alienate those close to them

because of their excessive demands for support – a process that elicits rejection that in turn serves to intensify or maintain depression. Cheng et al.[21] also reported that poor social support at workplace had significant impact on work-related disease and would contribute towards ill health. Lack of social support had also been shown to have psycho-physiological correlation, for instance, those reporting low social support at work had a high heart rate throughout the day and night and raised systolic blood pressure at work[22].

A study conducted by Dunnagan et al.[4] also proved that job-related depression was a product of stress and job dissatisfaction. Lack of social support and resources, little control and autonomy on the job, and unfair and overly demanding workloads and expectations could breed depression. Because of the strong association between the development of depression and the psychosocial work environment, businesses that contribute to negative employee affect may incur significant decreases in productivity, quality, and profit due to increases in absenteeism and turnover. These are consistent with the findings from Revicki et al.[5] that anger, depression, work stress, and job satisfaction were highly related. They also found a direct relationship between stress and depression and they concluded that employee emotions were closely linked to perceptions of social support and resource availability in the workplace.

Another risk factor of depression in laboratory technicians in HUSM was *high psychological demand*. The odds of having depression for high psychological demand was 3.0 times higher compared to low psychological demand (adjusted OR 3.0, 95%CI 1.0-8.8). However, there is some debate about whether the job demand dimension predicts health. A review by Schnall et al.[23] found significant associations between job control and cardiovascular outcomes in 17 out of 25 studies (68%), whereas associations with job demands were found in only 8 of 23 studies (35%). In the Whitehall II (prospective cohort) study, a cohort of 6,895 male and 3,414 female London-based civil servants aged 35-55 years at baseline also showed that poor health was associated with lower job control but not with high job demands[24].

Our study also showed that laboratory technicians in KKM hospitals with *low decision authority* have almost 10-fold risks of experiencing job-related depression as compared to those with high decision authority (adjusted OR 9.7, 95% CI 1.0-91.1). This is in line with

the findings of Mausner-Dorsch and Eaton[15], which identified similar relationships between the psychosocial work environment and job-related depression. Karasek and Theorell[25] suggested that psychosocial job factors could be the next strongest set of predictors of health and illness after age in an extensive investigation of the relationship between work and non-work factors on illness and illness behavior. Additionally, a concept commonly supported in the job-stress literature has been that the lack of certain job factors contributes towards certain stress-related health problems. One of the related studies was conducted by Baba and Schwind[26] to examine how work and non-work factors influenced mental health among Japanese workers.

Conclusion

Strengthening the social support network (supervisors and coworkers), reducing psychological job demand, and increasing decision-making authority of laboratory technicians may go a long way towards reducing job-related depression. Our results suggest that each factor in the psychosocial work environment – social support, psychological job demand, and decision authority – independently provides a better prediction of job-related depression than does combined exposures.

References

1. National Institute of Mental Health. Depression. Retrieved on August 28, 2002 from http://www.nimh.nih.gov/publicat/depression.cfm.

2. Goetzel RZ, Anderson DR, Whitmer R, William MBA, Ozminkowski RJ, Dunn RL. The relationship between modifiable health risks and health care expenditures: an analysis of the multi-employer HERO health risk and cost database. J Occup Environ Med 1998; 40: 843-54.

3. Kessler RC, Barbar C, Birnbaum HG, Franket RG. Depression in the workplace: effects on short-term disability. Health (Millwood) 1999; 18: 163-71.

4. Dunnagan T, Peterson M, Haynes G. Mental health issues in the workplace: a case for a new managerial approach. J Occup Environ Med 2001; 43: 1073-80.

5. Revicki DA, Whitley TW, Gallery ME. Organizational characteristics, perceived work stress, and depression in emergency medicine residents. J Behav Med 1993; 19: 74-81.

6. Wah L. The emotional tightrope. Manage Review 2000; 18: 38-43.

7. Greenspan A. The Workplace and Cardiovascular Disease. Occupational Medicine: State of the Art Reviews, 2000, Vol. 15, No. 1 (Leaflet).

8. Shigemi J, Mino Y, Tsuda T. Stability of factor structure and correlation with perceived job stress in General Health Questionnaire: a three-wave survey over one year in Japanese workers. J Occup Health 2000; 42: 284-91.

9. Ministry of Health, Malaysia. 1996 Annual Report. Kuala Lumpur: Ministry of Health.

10. Karasek R. Job demands, job decision latitude and mental strain: implications for job redesign. Admin Sci Quarter 1979; 24: 285-307.

11. Karasek R. Job Content Questionnaire and User's Guide. Department of Work Environment, University of Massachusetts, Lowell. Lowell: University of Massachusetts, 1997.

12. Harmy MY. A Comparative Study of Job Stress in Nurses in Hospital Universiti Sains Malaysia and Clerical Workers in Kota Bharu District, Kelantan. Unpublished Master of Family Medicine, USM Dissertation, 2001.

13. Norusis MJ. SPSS 10.0: Guide to Data Analysis. New Jersey: Prentice-Hall, 1999.

14. Karasek R, Baker D, Marxer F, Ahlbom A, Theorell T. Job decision latitude, job demands and cardiovascular disease: a prospective study of Swedish men. Am J Pub Health 1981; 71: 694-705.

15. Mausner-Dorsch H, Eaton WW. Psychosocial work environment and depression: epidemiologic assessment of the demand-control model. Am J Pub Health 2000; 90: 1765-70.

16. Kalimo R, El-Batawi MA, Cooper CL. Reactions to stress. In: Kalimo R, Mejman T (eds). Psychosocial Factors at Work and Their Relation to Health. Geneva: World Health Organization, 1987; 23-96.

17. Hammen C. Depression. In: Burke et al. (eds). Clinical Psychology: A Modular Course. United Kingdom: Psychology Press, 1997; 27-42.

18. Janssen PM, de Jonge RN, Bakker AB. Specific determinants of intrinsic work motivation, burnout and turnover intentions: a study among nurses. J Adv Nurs 1999; 29: 1360-9.

19. Costello CG. Social factors associated with depression: a retrospective community study. Psychol Med 1982; 12: 329-39.

20. Blazer DG, Kessler RC, McGonagle KA, Swartz MS. The prevalence and distribution of major depression in a national community sample: the national co-morbidity survey. Am J Psychiatry 1994; 151: 979-86.

21. Cheng Y, Kawachi I, Coakley HE, Schwartz J, Colditz G. Association between psychosocial work characteristics and health functioning in American women: prospective study. BMJ 2000; 320: 1432-6.

22. Theorell T. Psychosocial factors in the work environment: occupational medicine perspective. In: Waldron HAA, Edling C (eds). Occupational Health Practice, 4th edn. London: Butterworth & Heinemann, 1997; 257-77.

23. Schnall PL, Landsbergis PA, Baker D. Job strain and cardiovascular disease. Ann Rev Pub Health 1994; 15: 384-411.

24. Bosma H, Michael GM, Harry H, Amanda CN, Eric B, Stephen AS. Low job control and risk of coronary heart disease in Whitehall II (prospective cohort) study. BMJ 1997; 314: 558-65.

25. Karasek R and Theorell T. Current issues relating psychosocial job strain and cardiovascular disease research. J Occup Health Psychol 1996; 3: 19-26.

26. Baba VV, Schwind HF. Work, non-work and mental health: a study of Japanese managers. Internat Sociol Assoc 1990 [Leaflet].

Appendix 1: Questions related to depression (Section II – Questions R1 – R8)

PLEASE MARK THE WORDS THAT BEST DESCRIBED YOUR LIFE. IF YOUR LIFE IS SOMEWHERE IN BETWEEN, PLEASE MARK THE CORRECT BOX.

1. Is your life:

1	2	3	4	5	6	7
☐	☐	☐	☐	☐	☐	☐
Boring						Interesting

2. Is your life:

1	2	3	4	5	6	7
☐	☐	☐	☐	☐	☐	☐
Enjoyable						Miserable

3. Is your life:

1	2	3	4	5	6	7
☐	☐	☐	☐	☐	☐	☐
Worthwhile						Useless

4. Is your life:

1	2	3	4	5	6	7
☐	☐	☐	☐	☐	☐	☐
Friendly						Lonely

5. Is your life:

1	2	3	4	5	6	7
☐	☐	☐	☐	☐	☐	☐
Full						Empty

6. Is your life:

1	2	3	4	5	6	7
☐	☐	☐	☐	☐	☐	☐
Hopeful						Discouraging

7. Is your life:

1	2	3	4	5	6	7
☐	☐	☐	☐	☐	☐	☐
Rewarding						Disappointing

8. Is your life:

1	2	3	4	5	6	7
☐	☐	☐	☐	☐	☐	☐
Brings Out the Best In You						Doesn't Give You Much Chance