RISK FACTORS OF JOB-RELATED DEPRESSION IN LABORATORY TECHNICIANS IN HOSPITAL UNIVERSITI SAINS MALAYSIA (HUSM) AND KEMENTERIAN KESIHATAN MALAYSIA (KKM) HOSPITALS IN KELANTAN

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Abstract. A cross-sectional study was conducted to determine the risk factors of job-related depression in 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 from HUSM and 79 from KKM Hospitals were selected and 84 (82.4%) from HUSM and 71 (89.9%) from KKM Hospitals were recruited as study subjects. Data were collected by self-administered questionnaire using the validated Malay version of the Job Content Questionnaire (JCQ), originally developed by Robert Karasek. The results indicated significant associations between the risk factors of job-related depression, and low social support, and high psychological demands (OR 3.0, 95% CI 1.1-8.8) in laboratory technicians in HUSM. However, for laboratory technicians in KKM Hospitals, the significant association was between job-related depression, and low social support and low decision authority (OR 9.7, 95% CI 1.1-91.1). Low social support was highly associated with job-related depression in laboratory technicians in HUSM and KKM Hospitals. We, therefore, conclude that low social support positively predicted depression in laboratory technicians in HUSM and KKM Hospitals. In addition, high psychological demands also significantly predicted depression in laboratory technicians in HUSM; however, for laboratory technicians in KKM Hospitals, low decision authority was the significant predictor of depression.

INTRODUCTION

Depression may often be initiated by high levels of long-term job stress, and be related to failure associated with stress-related under-performance, and life crises. Work-related depression is a clinical illness and workers should take this seriously (National Institute of Mental Health, 2001). Trends in occupational health psychology also suggest that the prevalence of stress and depression are increasing (Dunnagan *et al*, 2001). Revicki and colleagues (1993) found a relationship between job stress and depression among workers, which could directly influence worker satisfaction.

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Goetzel *et al* (1998) showed that 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. 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 effects. Kessler *et al* (1999) found that 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 US$182 and US$395.

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 (Wah, 2000).

Fava *et al* (1996), in their clinical assessment of a possible relationship between coronary artery disease risk factors and anger, and anxiety, found that depressed patients with anger attacks had higher cholesterol levels than those without anger attacks. The findings lend support to a hypothesis that workers who suffer from stress and depression due to workplace climate, culture, or both, and who are prone to anger, may be at a higher risk of heart disease than their less depressed and angered counterparts. These findings are applicable to management and workplace health professionals alike, because the negative consequences of worker depression, anger, and stress have significant implications for organizational and employee health outcomes.

In the present study, we sought to determine the risk factors of job-related depression in laboratory technicians in Hospital Universiti Sains Malaysia (HUSM) and Kementerian Kesihatan Malaysia (KKM) Hospitals, in Kelantan.

METHODOLOGY

Study design

This was a cross-sectional comparative study designed to identify the risk factors of depression in the job. Various categories of laboratory technicians from HUSM and KKM Hospitals were chosen.

Sample size

Sample size calculation was based on the guideline, "Job Content Questionnaire and User's Guide" by Robert Karasek (Karasek, 1997). The formula was used to give the exact relationship between statistical power, sample size, and confidence interval. A sample size of 50 should allow detection of a score difference of 0.50 standard deviations and 0.75 standard deviation differences could be detected with a smaller sample. However, to detect a 0.25 standard deviation difference would require a substantially larger sample than 50. Table 1 shows the 'typical' sample size required, at a given scale difference, and at a given level of statistical significance; the calculations are based on a two-tailed test for significance.

Recruitment of study subjects

Specific inclusion and exclusion criteria were developed to select the study subjects and only those who met the inclusion criteria were recruited into the study. The inclusion criteria comprised; (a) aged between 18 to 55 years, and (b) holding grade U8 post. It has been reported that age influences responses to stress (Kalimo *et al*, 1987). We chose grade U8 since the majority of the laboratory technicians were categorized under this grade. The exclusion criterion was the diagnosis of any psychiatric illness. These inclusion and exclusion criteria were used for both laboratory technicians in HUSM and KKM Hospitals. Out of 102 laboratory technicians in HUSM, 84 (82.4%) were willing to answer the questionnaire, whereas the response rate for KKM Hospitals was 89.9% (71/79).

Research protocol

The study protocol was reviewed and approved by the Research and Ethics Committee, School of Medical Sciences, Universiti Sains Malaysia, Kelantan Health Campus on 11th August 2001.

The study was conducted at laboratories in HUSM and in seven KKM Hospitals (Kota Bharu, Pasir Mas, Pasir Puteh, Tumpat, Tanah Merah, Machang, and Kuala Krai) in Kelantan. Data collection was done by self-administered questionnaire, the validated Malay version of the Job Content Questionnaire (JCQ). The JCQ was pretested in the local Malaysian language prior to data collection. Self-administration was done at the workplace.

Research instrument

The research instrument was Karasek's Job Content Questionnaire (JCQ) (Karasek, 1979). The JCQ is a questionnaire-based instrument designed to measure the content of work tasks.

Questions measure psychological strain (section II-questions R1-R8, measuring depression). However, there are no personality orientation scales or measures of non-job stressors included.

Statistical analysis

Data entry and analysis were done using the Statistical Program for Social Science (SPSS) Version 10.0 (Norusis, 1999). Means and standard deviation, and percentages, were calculated for continuous and categorical data, respectively, for socio-demographic characteristics and psychosocial job factors. To determine depression, the

median was chosen as a cut-off point, and those above the median was considered depressed, while those below the median were considered non-depressed.

Group differences amongst depressed and non-depressed laboratory technicians in HUSM and KKM Hospitals were examined using the independent *t*-test for continuous data, and chi-square test for categorical data. The level of significance was set at 0.05.

The associations between depression and socio-demographic characteristics and psychosocial job factors were examined by multiple logistic regression for both HUSM and KKM Hospitals.

All analyses were carried out in the Department of Community Medicine, School of Medical Sciences, Universiti Sains Malaysia, Kelantan Health Campus, Malaysia.

RESULTS

Table 2 shows the socio-demographic characteristics and psychosocial job factors of depression in 84 laboratory technicians in HUSM. There were no significant differences in age, sex, ethnic group, marital status, education level, and income per month. There were also no significant associations between depressive status and skill discretion, decision authority, psychological demand, social support, hazardous condition, and physical demand.

Table 3 shows the socio-demographic characteristics and psychosocial job factors of depression of 71 laboratory technicians in KKM Hospitals. There were significant differences in age (p=0.021), sex (p=0.026), and marginally insignificant for income per month (p=0.051). However, there were no significant differences in ethnic group, marital status, or education level. There were significant associations between depression status, and decision authority (p=0.039) and social support (p=0.001). However, there were no significant associations between depressive status and skill discretion, psychological demand, hazardous condition, and physical demand.

Table 4 shows the results of multiple logistic regression analysis of depression of 84 laboratory technicians in HUSM. The odds of depres-

Table 1
User Sample Size ("n" You) and given national sample group size ("n" Nat).

	Difference in means					
	0.75 std dev		0.50 std dev		0.25 std dev	
	'n' Nat	'n' You	'n' Nat	'n' You	'n' Nat	'n' You
p< 0.10	6	9	6	not pos	6	not pos
	11	5	11	25	11	not pos
	20	5	20	12	20	not pos
	40	4	40	9	40	95
	80	4	80	8	80	44
	160	4	160	8	160	35
p< 0.05	6	40	6	not pos	6	not pos
	11	9	11	>1,000	11	not pos
	20	7	20	20	20	not pos
	40	6	40	14	40	>1,000
	80	6	80	12	80	80
	160	5	160	11	160	53
p< 0.01	6	not pos	6	not pos	6	not pos
	11	33	11	not pos	11	not pos
	20	13	20	120	20	not pos
	40	10	40	30	40	not pos
	80	9	80	22	80	500
	160	8	160	19	160	121

* The number in the circle (80) is the sample size used as a guideline in this study.

Table 2
Socio-demographic characteristics and psychosocial job factors of depression in 84 laboratory technicians in HUSM.

Risk factors	Depressed		Non-depressed		p-value[a]
	No.	%	No.	%	
Socio-demographic characteristics					
Age (years)					
18-34	30	66.7	15	33.3	0.321
35-44	16	53.3	14	46.7	
45-55	4	44.4	5	55.6	
Sex					
Female	28	63.6	18	36.4	0.782
Male	22	57.9	16	42.1	
Ethnic group					
Non-Malay	10	66.7	5	33.3	0.534
Malay	40	58.0	29	42.0	
Marital status					
Non-married	19	63.3	11	36.7	0.596
Married	31	57.4	23	42.6	
Education level					
Non-university	2	100.0	0	0.0	0.147[b]
University	48	58.5	34	41.5	
Income per month (RM)					
700-1,300	27	71.1	11	28.9	0.096
1,301-1,700	12	57.1	9	42.9	
1,701-3,000	11	44.0	14	56.0	
Psychosocial job factors					
Skill discretion					
Low	27	58.7	19	41.3	0.865
High	23	60.5	15	39.5	
Decision authority					
Low	45	60.8	29	39.2	0.517
High	5	50.0	5	50.0	
Psychological demand					
Low	24	52.2	22	47.8	0.154
High	25	67.6	12	32.4	
Social support					
Low	19	70.4	8	29.6	0.096
Moderate	16	57.1	12	42.9	
High	13	48.1	14	51.9	
Hazardous condition					
Low	29	59.2	20	40.8	0.940
High	21	60.0	14	40.0	
Physical demand					
Low	26	61.9	16	38.1	0.402
High	20	52.6	18	47.4	

[a]χ^2-test; [b]Fisher's exact test

sion from high psychological demand was 3.0 times higher than for low psychological demand (95% CI 1.1-8.8), while low social support was 4.7 times (95% CI 1.2-18.8) higher than high social support.

Table 5 shows that the odds of having de-

Table 3
Socio-demographic characteristics and psychosocial job factors of depression in 71 laboratory technicians in KKM Hospitals.

Risk factors	Depressed		Non-depressed		p-value[a]
	No.	%	No.	%	
Socio-demographic characteristics					
Age (years)					
18-34	9	75.0	3	25.0	0.021
35-44	12	34.3	23	65.7	
45-55	7	29.2	17	70.8	
Sex					
Female	18	52.9	16	47.1	0.026
Male	10	27.0	27	73.0	
Ethnic group					
Non-Malay	2	40.0	3	60.0	0.979[b]
Malay	26	39.4	40	60.6	
Marital status					
Non-married	1	50.0	1	50.0	0.759[b]
Married	27	39.1	42	70.9	
Education level					
Non-university	16	40.0	24	60.0	0.912
University	12	38.7	19	61.3	
Income per month (RM)					
700-1,300	2	16.7	10	83.3	0.051
1,301-1,700	20	51.3	19	48.7	
1,701-3,000	6	30.0	14	70.0	
Psychosocial job factors					
Skill discretion					
Low	18	48.6	19	51.4	0.096
High	10	29.4	24	70.6	
Decision authority					
Low	26	44.8	32	55.2	0.039[b]
High	2	15.4	11	84.6	
Psychological demand					
Low	13	34.2	25	65.8	0.414
High	14	43.8	18	56.2	
Social support					
Low	12	63.2	7	36.8	0.001[b]
Moderate	14	48.3	15	51.7	
High	2	8.7	21	91.3	
Hazardous condition					
Low	12	30.0	28	70.0	0.065
High	16	51.6	15	48.4	
Physical demand					
Low	13	34.2	25	65.8	0.414
High	14	43.8	18	56.2	

[a,b] As per Table 2

pression for low decision authority was 9.7 times higher than high decision authority (95% CI 1.1-91.1) and low social support was 14.8 times (95% CI 2.4-89.3) higher than high social support in 71 laboratory technicians in KKM Hospitals. However, there was no association between haz-

Table 4
Adjusted association between psychosocial job factors and depression in laboratory technicians in HUSM (N = 84).

Risk factors	Coefficient (β)	Standard error	Wald statistic	p-value	Odds ratio	95% CI
Intercept	-1.94	0.73	-	-	-	-
High psychological demand	1.10	0.55	3.96	0.047	3.0	1.1-8.8
Social support						
Low	1.56	0.71	4.91	0.027	4.7	1.2-18.8
Moderate	1.28	0.65	3.83	0.050	3.6	1.0-12.9

Note: β = beta; CI = confidence interval.

Table 5
Adjusted association between psychosocial job factors and depression in laboratory technicians in KKM Hospitals (N = 71).

Risk factors	Coefficient (β)	Standard error	Wald statistic	p-value	Odds ratio	95% CI
Intercept	-4.81	1.40	-	-	-	-
Low decision authority	2.27	1.15	3.92	0.048	9.7	1.1-91.1
Social support						
Low	2.69	0.92	8.62	0.003	14.8	2.4-89.3
Moderate	2.38	0.87	7.45	0.006	10.7	2.0-59.0
High hazardous condition	1.15	0.60	3.70	0.054	3.2	0.9-10.2

Note: β = beta; CI = confidence interval.

ardous condition and depression, although hazardous condition was included in the final model.

The final model of risk factors for depression in laboratory technicians in HUSM and KKM Hospitals using multiple logistic regression analysis was checked for fitness using the Hosmer-Lemeshow goodness-of-fit test. The p-value was not significant, thus the model fit. The main effect of the model was also checked for interactions by using the 2-way interaction test and if this was not significant there were no significant interactions between each variable in the final model.

DISCUSSION

The main risk factor for depression in laboratory technicians in HUSM and KKM Hospitals was low social support. The study showed specifically that when stress at work occurs, workers who lack a supportive intimate relationship with another person are significantly more likely to develop depression (Costello, 1982).

Research has explored the role of actual supports as well as perceptions of support, and the role of the size of social networks. The mechanisms of the effect continue to be explored, with support both for a buffering effect (support reduces the likelihood of depression in the face of stress) and a main effect (both low support and stress independently predict depression). However, this voluminous research field is beyond the scope of this discussion.

Of particular importance for the prediction of depression, investigators have found that depressed people have fewer supportive relationships and that depressed persons perceive less support from the relationships that they do have (Hammen, 1997). As Blazer *et al* (1994) 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.

Lack of social support can also contribute to the development of job strain, because opportunities to benefit from positive (healthy) social contacts are reduced. Particularly with regard to 'people 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 and colleagues, in 1999, 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.

Cheng *et al* (2000) also reported that poor social support in the workplace had a significant impact on work-related disease and could contribute to ill health. Lack of social support has also been shown to have a 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 while at work (Theorell, 1997).

A study conducted by Dunnagan *et al* (2001) also proved that work-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 of Revicki *et al* (1993), 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 for depression in laboratory technicians at HUSM was high psychological demand. The odds of having depression for high psychological demand was 3.0 times higher than low psychological demand. However, there is some debate about whether the job demand dimension predicts health. A review by Schnall *et al* (1994) 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 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 (Bosma *et al*, 1997).

A slightly modified demand-control model shows strength in characterizing the association between psychosocial job factors and depression. This study showed that skill discretion was not related to depression, but decision authority was a significant risk factor for depression among the laboratory technicians in KKM Hospitals. Decision latitude might therefore be a very valuable construct for other health concerns (such as cardiovascular disease) but not for depression. This is in line with the results of Mausner-Dorsch and Eaton (2000), who tested a similar pattern of relationships between the psychosocial work environment and depression.

Karasek and Theorell (1996) 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 in illness and illness behavior. In addition, a concept commonly supported in the job-stress literature has been that the lack of certain job factors contribute towards certain stress-related health problems. One related study was conducted by Baba and Schwind (1990), who examined how work and non-work factors influenced mental health among Japanese workers.

Our results suggest that each factor in the psychosocial work environment separately provides a better evaluation than does combined exposure to psychological demands and decision latitude when evaluating the effect of psychosocial factors at work on depression.

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