A STUDY OF JOB STRAIN AND DISSATISFACTION AMONG LECTURERS IN THE SCHOOL OF MEDICAL SCIENCES UNIVERSITI SAINS MALAYSIA

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Abstract. Job stress has now become one of the most significant health and safety issues in the workplace and one of the least understood areas of organizational cost. A cross-sectional study to assess job strain and dissatisfaction in lecturers of the School of Medical Sciences, Universiti Sains Malaysia (USM) was undertaken between August 2001 and May 2002. The original English version of the Job Content Questionnaire (JCQ) version 1.7 (revised 1997) by Robert Karasek was self-administered to 73 (response rate 58.4%) lecturers in School of Medical Sciences USM. The prevalence of job strain (defined by low decision latitude and high psychological demands) in USM was 23.3%. The risk factors of job strain in the lecturers were psychological stressors (adjusted OR 1.2, 95% CI 1.0, 1.4), created skill (adjusted OR 0.4, 95% CI 0.2, 0.8) and working in clinical-based departments (adjusted OR 18.7, 95% CI 1.6, 22.7). The prevalence of job dissatisfaction was 42.6%. Associated factors of job dissatisfaction in USM lecturers were decision authority ($p < 0.001$) and psychological job demand ($p < 0.001$). We conclude that psychological stressors and created skill were non-protective and protective, respectively, against job strain in USM lecturers. Clinical-based lecturers experienced higher job strain compared to non-clinical-based lecturers. Psychological job demand was strongly associated with job dissatisfaction, and decision authority was protective against job dissatisfaction.

INTRODUCTION

Stress and the nature of its effects on health has been the subject of increasing interest over the past decade concurrent with the increasing pressures, changes and demands of modern life. It is also a major factor contributing directly or indirectly to death. There is some evidence to suggest that stress plays an important role in some types of chronic health problems, such as cardiovascular diseases, musculoskeletal disorders and psychological illness (Theorell and Karasek, 1996; Phoon, 1999). The issue of job stress is of utmost importance to the public health community and working people. The economic costs of job stress in general (absenteeism, lost productivity) are difficult to estimate but most importantly, there is a potential for preventing much illness and death. Occupational stressors are also commonly linked with lower levels of job satisfaction and higher turnover (Kinman, 2001). Studies that have investigated job stress and job satisfaction have generally found an inverse relationship between several job stressors and job satisfaction (Burke, 1996). It is known that the medical profession is a challenging but stressful profession. Work pressures, consistently linked to job stress among physicians, include heavy workloads, time 'on-call', fatigue, conflicts between work and personal lives, and dealing with patient problems, among others (Mawardi, 1979; Linn *et al*, 1985; Cooper *et al*, 1989). In a paper review on occupational stressors and strains among academics working in UK universities, Kinman (2001) found that in comparison to other professionals and community samples, academic staff experience less job satisfaction and ex-

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tremely low levels of psychological health. A medical school lecturer is expected to assume a number of roles – being a clinician, teacher, researcher, student supervisor and even administrator. Some of them are also members of various committees in the university. Role ambiguity, conflict and overload may cause the development of stress symptoms. A review by Kinman (2001) revealed that a high proportion of academicians have strong desire to leave higher education and/or regret choosing an academic career. This has potentially serious implications not only for the individuals themselves, but also for the quality of higher education.

MATERIALS AND METHODS

Study design

From August 2001 to May 2002, we conducted a cross-sectional study on all lecturers working in the School of Medical Sciences, Universiti Sains Malaysia, Kubang Kerian, Kelantan (USM).

Method

Permission to carry out the study was obtained from the Campus Director, School of Medical Sciences USM. A total of 125 self-administered questionnaires were sent. The questionnaires were sent out to the various departments with a brief explanation of the questionnaire, a consent form and a copy of the permission letter from the Campus Director. The respondents were also given a written guarantee of confidentiality. Reminders were sent to the non-respondents three weeks after the initial sending. Written reminders with another copy of the questionnaire were sent after a further interval of three weeks and a month followed by verbal reminders over the phone and also direct personal contact with the remaining non-responders.

Participants

Since a low response rate was anticipated, no sampling was done in recruiting the subjects. Study subjects were identified from the lecturer registry obtained from the administration department, Dean's office of the School of Medical Sciences USM. From the USM registry, out of 162 names, only 137 lecturers were selected after excluding contract lecturers and trainee lecturers. Out of this, only 125 questionnaires were sent successfully as the remaining lecturers were not available due to courses or sabbatical leave.

Research instrument

The Job Content Questionnaire (JCQ), a self-administered instrument for psychosocial job strain, was used, with permission from the author. The JCQ scales measure various aspects of job demand, control and support. Cross-national validity and reliability studies have been done in six broadly representative populations from four advanced industrialized countries namely the United States, Canada, Netherlands and Japan. In this study, the original English version of the JCQ was used. Most questions were scored on a Likert scale of 1 to 4 (strongly disagree, disagree, agree and strongly agree; or often, sometimes, rarely and never). All variable and outcome measures were calculated using the formulae for Job Content instrument scale construction provided in the Job Content Questionnaire and User Guide (Table 1).

Statistical analysis

Data entry and analysis was done using the Statistical Program for Social Sciences (SPSS) Version 10.05 for Windows (SPSS Website). Responses were entered according to codes. Prior to analyses, some of the responses were computed and recoded accordingly. To determine the prevalence of job strain (high psychological job demands and low decision latitude) in lecturers, decision latitude and psychological job demands scores were dichotomized by median cut-off points to obtain high and low values for each scale. Based on the Karasek's Job Strain Model (Fig 1), a combination of high psychological job demand (≥ 35.0) and high decision latitude (≥ 74.0) was defined as 'active', high psychological job demand and low decision latitude was defined as 'high strain', low psychological job demand and low decision latitude was defined as 'passive' and low psychological job demand and high decision latitude was defined as 'low job strain'. This method was used in other studies (Mausner-Dorsch and Eaton, 2000; O'Corner *et al*, 2000; Harmy, 2001). Logistic regression analysis was done to determine the predictors of job strain. In

Table 1
Formulae for job content instrument scale construction.

Skill Discretion = [Q3 + Q5 + Q7 + Q11 + (5 – Q4)] x 2
Created Skill = [Q3 = Q5 = Q11]
Decision Authority = [Q6 + Q10 + (5 – Q8)] x 4
Decision Latitude = Skill Discretion + Decision Authority
Psychological Job Demands = [(Q19 + Q20) 3 + (15 – (Q22 + Q23 + Q26)) 2]
Job Insecurity = [Q33 + Q36 + (5 – Q34)]
Total Psychological Stressors = z-scored addition of Psychological Job Demand + Job Insecurity
Coworker Support = [Q53 + Q54 + Q56 + Q58]
Supervisor Support = [Q48 + Q49 + Q51 + Q52]
Social Support = Coworker Support + Supervisor Support
Physical Exertion = Q21
Hazardous Conditions = [Q41 + Q42 + Q44 + Q45 + Q47}
Toxic Exposures = [Q39 + Q40 + Q43]
Total Physical Hazards = z-scored addition of Hazardous Condition + Toxic Exposures
Total Physical Stressors = z-scored addition of Physical Exertion + Total Physical Hazards
Job Dissatisfaction = [(V3 + V5 – V2 – V4) 3 – (V1 x 4) + 40] / 60
Depression (Life Dissatisfaction) = [R2 + R3 + R4 + R5 + R6 + R7 + R8 – R1] / 48
Physical/Psychosomatic Strain = [$(4 – V6)^2$ + $(4 – V11)^2$ +$(4 – V12)^2$ + $(4 – V13)^2$] / 36
Sleeping Problems = [$(4 – V14)^{2+}(4 – V15)^2$] /18
Psychological Job Demand (FR) = [Q19 + Q20 – Q22 – Q23 – Q26 + Q27 + Q28 + Q29 + Q32]

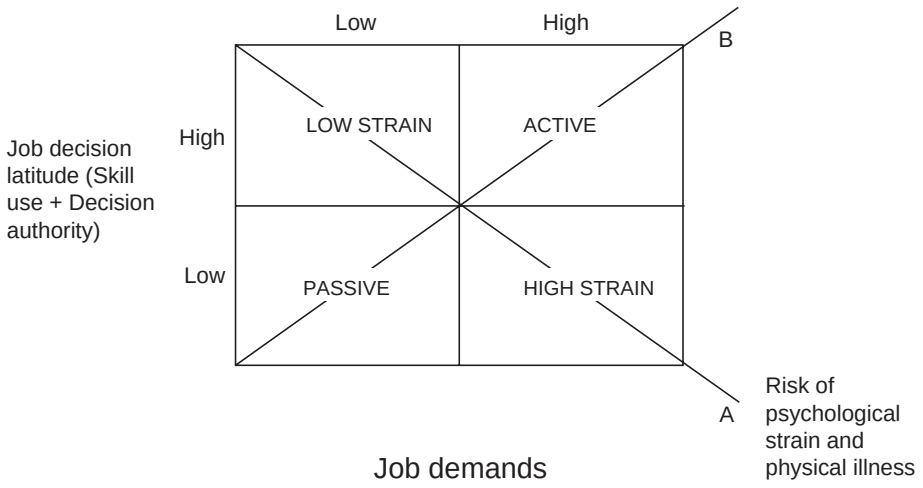

Fig 1–Karasek Job Strain Model. (Adapted from: Schnall *et al*, 1994).

the analysis, job strain was dichotomized into 'high job strain' and 'non high job strain' (Mausner-Dorsch and Eaton, 2000). $p < 0.05$ was used to determine statistical significance. The adjusted odds ratio (OR) was estimated with a 95% confidence interval.

A median cut-off point for job dissatisfaction (0.2667) was used to categorize the variable into high and low job dissatisfaction, to determine the prevalence. For this outcome variable, there were missing data, thus, we analyzed only 68 USM lecturers. Data exploration and simple lin-

ear regression analysis were done on all variables. To assess the associated factors of job dissatisfaction, stepwise multiple linear regression analysis was performed.

RESULTS

Seventy-three lecturers responded to the questionnaire, with a response rate of 58.4%; the majority of the lecturers were males (68.5%). Analysis showed that there was no significant difference in gender and department-base between the non-respondents and respondents ($p < 0.05$). The prevalence of high job strain in USM lecturers was 23.3% (Table 2). A significantly higher proportion of clinical-based lecturers reported high job strain compared to non clinical-based lecturers (34.1% and 6.9%, respectively) (Table 3). Simple logistic regression analysis showed that department-base (crude OR 7.0; 95% CI 1.5, 33.4), created skill (crude OR 0.6; 95% CI 0.4, 0.9) and psychological job demand (Framingham) (crude OR 1.2; 95% CI 1.0, 1.4) were significantly associated with high job strain in USM lecturers. Multiple logistic regression analysis showed that the risk factors for high job strain in USM lecturers were psychological stressors (adjusted OR 1.2; 95% CI 1.0, 1.4), created skill (adjusted OR 0.4; 95%CI 0.2, 0.8), and working in clinical-based departments (adjusted OR 18.9; 95% CI 1.6, 22.7) (Table 4). The final model explained 30.4% of the variance in job strain in USM lecturers.

The prevalence of high job dissatisfaction in USM lecturers was 42.6% (Table 5). Simple linear regression analysis of 6 demographic, 11 job factors and 2 non-job factors on job dissatisfaction in 68 USM lecturers showed that significant associated factors of job dissatisfaction were decision authority ($p < 0.01$), decision latitude ($p < 0.01$), psychological stressors ($p < 0.01$), job strain ($p < 0.05$), psychological job demand ($p < 0.05$) and depression/life dissatisfaction ($p < 0.01$) (Table 6). Multivariate analysis revealed that the significant associated factors of job dissatisfaction in 68 USM lecturers were decision authority ($p < 0.001$) and psychological job demand ($p < 0.001$). This model explained 23% of the variance for job dissatisfaction in 68 USM lecturers (Table 7).

Table 2
Job strain in 73 USM lecturers.

	Job strain[a]		
	No	%	(95% CI)[b]
High strain	17	23.3	(14.2, 34.6)
Non high strain	56	76.6	(65.4, 85.8)
Active	20	27.4	(17.6, 39.1)
Passive	21	28.8	(18.8, 40.6)
Low strain	15	20.5	(11.9, 31.6)
Total	73	100.0	

[a] Median cut-off point for decision latitude and psychological job demand.
[b]Binomial confidence interval.

Table 3
Prevalence of job strain in 44 clinical-based and 29 non-clinical-based lecturers in USM.

Job strain	Clinical[a]			Non-clinical[b]			Differences
	No.	%	(95% CI)[c]	No.	%	(95% CI)[c]	(p-value)[d]
USM							
High strain	15	34.1	(16.8, 45.2)	2	6.9	(0.8, 22.8)	
Low strain	29	65.9	(50.1, 79.5)	27	93.1	(77.2, 99.1)	< 0.01
Total	44	100.0		29	100.0		

[a]Clinical-based, includes medicine, surgery, pediatrics, orthopedics, otorhinolaryngology, ophthalmology, psychiatry, obstetrics and gynecology, and family medicine.
[b]Non-clinical-based, includes anatomy, physiology, pathology, microbiology, hematology, pharmacology, radiology, community medicine, and medical education.
[c]Binomial confidence interval.
[d]Pearson's χ^2 : level of significance $p < 0.05$.

Table 4
Risk factors of 5 demographic, 11 job, and 2 non-job factors on job strain in 73 USM lecturers.

Variables	Crude OR[a]	95% CI	p-value[c]	Adjusted OR[b]	95% CI	p-value[c]
Demographic						
Age						
>40 years	1					
≤40 years	1.8	0.5, 5.8	NS			
Gender						
Male	1					
Female	1.7	0.5, 5.8	NS			
Marital status						
Married	1					
Single/divorced	1.5	0.3, 6.6	NS			
No. of children						
≤3	1					
>3	1.1	0.4, 3.4	NS			
Duration of work (years)	0.94	0.8, 1.0	NS			
Job factors						
Department						
Non-clinical-based	1			1		
Clinical-based	6.9	1.4, 13.4	0.015	18.9	1.6, 22.7	0.019
Created skill	0.6	0.4, 0.9	0.018	0.4	0.2, 0.8	0.008
Supervisor support	0.9	0.9, 1.1	NS			
Coworker support	0.9	0.6, 1.5	NS			
Social support	0.9	0.9, 1.1	NS			
Psychological stressors	1.0	0.6, 1.6	NS	1.2	1.0, 1.4	0.036
Psychological job demand Framingham	1.2	1.0, 1.4	0.041			
Psychosomatic strain	0.9	0.5, 1.8	NS			
Psychological strain	1.0	0.6, 1.6	NS			
Job dissatisfaction	2.0	0.7, 6.4	NS			
Job insecurity	0.9	0.7, 1.4	NS			
Non-job factors						
Depression/life dissatisfaction	1.2	0.6, 2.6	NS			
Sleeping problem	5.5	0.2, 14.7	NS			

[a]Simple logistic regression analysis ; OR = odds ratio.
[b]Multiple logistic regression analysis (adjusted for age, gender, and marital status).
[c]LR statistics: level of significance $p < 0.05$, $p < 0.01$; NS: not significant $p \geq 0.05$.

Table 5
Job dissatisfaction in 68 USM lecturers.

	Job dissatisfaction		
	No	%	(95% CI)[a]
High	29	42.6	(30.7, 55.2)
Low	39	57.4	(44.8, 69.3)
Total	68	100.0	

[a]Binomial confidence interval

DISCUSSION

The response rate in USM lecturers was 58.4%. This is comparable to other studies on similar population groups, using the same research instrument, that reported rates from 33% to 68.8% (Linn *et al*, 1985; Richardsen and Burke, 1991; Deary and Blenkin, 1996; O'Corner, 2000; O' Corner *et al*, 2000). Although the reference studies used different study designs, this response

Table 6
Simple linear regression analysis of 6 demographic, 11 job and 2 non-job factors on job dissatisfaction in 68 USM lecturers.

Variables	*b*[a]	95% CI [b]	Overall *F* test		R^2 [d]
			F statistics (*df* [c])	p-value	
Demographic factors					
Age (years)	8.6×10^{-4}	0.01, 0.01	0.0 (1,65)	NS[e]	0.001
Gender (male/female)	-2.5×10^{-3}	-0.97, 0.09	0.0 (1,66)	NS	0.006
Marital status (married/not married)	-7.3×10^{-2}	-0.19, 0.04	1.5 (1,66)	NS	0.023
No. of children	-7.6×10^{-3}	-0.13, 0.02	0.5 (1,66)	NS	0.007
Salary (RM)	-6.3×10^{-6}	0.00, 0.00	0.5 (1,65)	NS	0.008
Duration of work (years)	1.7×10^{-3}	-0.01, 0.02	0.1 (1,65)	NS	0.002
Job factors					
Department-base	-6.3×10^{-2}	-0.02, 0.15	1.9 (1,66)	NS	0.029
Created skill	-2.8×10^{-2}	-0.06, 0.01	2.7 (1,66)	NS	0.039
Skill discretion	-9.6×10^{-3}	-0.02, 0.00	3.4 (1,65)	NS	0.050
Decision authority	-1.1×10^{-2}	-0.02,-0.00	10.5 (1,66)	< 0.01	0.137
Decision latitude	-6.3×10^{-2}	-0.01,-0.00	7.9 (1,65)	< 0.01	0.109
Supervisor support	2.1×10^{-3}	-0.00, 0.00	0.5 (1,66)	NS	0.008
Coworker support	-2.3×10^{-2}	-0.06, 0.02	1.4 (1,66)	NS	0.021
Social support	1.6×10^{-3}	-0.00, 0.01	0.3 (1,66)	NS	0.004
Psychological stressors	1.2×10^{-2}	0.00, 0.02	9.8 (1,64)	< 0.01	0.133
Psychological job demand	1.1×10^{-2}	0.00, 0.02	6.8 (1,65)	< 0.05	0.095
Job strain	4.1×10^{-2}	-0.02, 0.18	4.2 (1,66)	< 0.05	0.060
Non-job factors					
Depression/Life dissatisfaction	0.3	0.12, 0.55	9.4 (1,66)	< 0.01	0.125
Sleeping problem	0.2	0.08, 0.43	8.2 (1, 66)	< 0.01	0.110

[a]*b* : Unstandardized regression coefficients; [b]95% CI: Confidence interval for *b*; [c]*df* : Degree of freedom; [d]R^2 : Coefficient of determination; [e]NS: Not significant ($p \geq 0.05$).

Table 7
Associated factors of job dissatisfaction in 68 USM lecturers.

Variables	*b*[a]	95% CI [b]	p-value[c]	R^2 [d]
Decision authority	-1.6×10^{-2}	-0.02,-0.01	0.000	
Psychological job demand	1.9×10^{-2}	0.01, 0.03	0.000	
Job strain	-0.1	-0.22,-0.01	0.073	0.231
Age	3.9×10^{-3}	-0.00, 0.01	0.297	
Gender	-2.0×10^{-4}	-0.08, 0.01	0.996	
Constant	0.1	-0.41, 0.62	0.193	

[a]*b* Unstandardized regression coefficients; [b]95% CI: Confidence interval for *b*;
[c]p-value for overall *F* test: Level of significance: $p < 0.05$; [d]Adjusted *R* square.

rate was acceptable because we were asking very busy staff to participate in a lengthy questionnaire.

Our study revealed that prevalence of job strain (referred to as 'high job strain' in this study) in USM lecturers was 23.3%. The findings were lower than the prevalence obtained by O'Connor (2000) who showed that 31% of General Practitioners experienced high job strain. The high pro-

portion (23.3%) of lecturers experiencing high job strain could be due to a lack of control or autonomy in the face of increasing job demands. Sutherland and Cooper (1992) emphasized that if autonomy is removed, the high demand on doctors' time, heavy workload and responsibility for others may be intolerable burdens, resulting in high job strain. Harden (1999) noted that in medicine, there are particular pressures on teachers (1999), changes in health care delivery, public expectations and medical education.

A significantly higher proportion of clinicians (34.1%) in USM reported high job strain compared to non-clinicians (6.9%) (Table 2). On the contrary, Linn *et al* (1985), in their study comparing job-related stress levels between academic and clinical faculties in a major teaching hospital in the United States, found that there was no significant difference in the stress level, although there was a difference in the stressor items. For clinicians, the significant stressors were having to deal with the intensely emotional aspects of patients' lives, such as death; having to deal with difficult or problem patients; meeting the needs and demands of patients; and having spontaneous home activities interrupted by work-related telephone calls and pages. A study of consultant doctors in Scotland showed that a higher clinical workload was related to higher levels of stress (Deary and Blenkin, 1996). Academic and clinical roles were self-selected and differences may be related to personality factors due to career choice or to differences in demographic characteristics. In our study, personality factors were not accounted for. Within occupation variance of personality factors and other personal and demographic factors, such as personality, genetic background and family background, were uncorrected biases in the JCQ (Schwartz and Pieper, 1985). Therefore, it is assumed that the differences in job strain between clinicians and non-clinicians in USM was also due to similar factors.

Univariate analysis showed that department base, created skill and psychological job demand (Framingham version) were significant risk factors for job strain. After controlling for all statistically significant and biologically plausible variables in multiple logistic regression analysis, the important and significant risk factors were psychological stressors (adjusted OR 1.2; 95% CI 1.0, 1.4), created skill (adjusted OR 0.4; 95% CI 0.2, 0.8) and clinical-based departments (adjusted OR 18.9; 95% CI 1.6, 22.7) as shown in Table 3. Clinicians had an alarmingly higher risk of job strain compared to non-clinicians (adjusted OR 18.9). Deary and Blenkin (1986), concluded that clinical workloads were related to higher levels of stress, thereby supporting our findings. Other reasons might be due to the factors discussed above or non-job factors which are beyond the scope of this study. The Cox and Snell R^2 for this model was 0.304 indicating that the final model only explained 30.4% of the variance in job strain in USM lecturers. Other variances may be explained by personality, non-job factors or organizational factors, which were not assessed in this study.

Clinicians had an alarmingly higher risk of job strain compared to non-clinicians (adjusted OR 18.9). Deary and Blenkin (1996) concluded that clinical workloads were related to higher levels of stress, thereby supporting our findings. High psychological stressors significantly associate with high job strain while created skill showed a negative main effect. The psychological stressor scale consists of a combination of psychological demand and job insecurity. This finding is supported by work environment specialists who found that job strain can be reduced by lessening demands, such as unrealistic deadlines, or giving workers more control over their working conditions (Anonymous, 2001). In addition, Harden (1999) noted that, a lack of resources, support and a philosophy of having to do more with the same resources, are problems in medical education that contribute to stress in staff. Kinman (2001) emphasized that role overload has become a particularly salient stressor for modern academicians, as their work encompasses many different, often conflicting roles. Job insecurity undoubtedly has important influence on job strain. Professionals and graduate jobs that were once secure may be subject to job insecurity, which is associated with increased tress (Kate *et al*, 2001). Therefore, a combination of psychological job demands and job insecurity, termed as psychological stressors, have a direct effect on job strain. Created skill means the requirement to learn new things, be-

ing creative on the job and the ability to develop one's own special abilities. It had negative associations with job strain for both USM and UKM lecturers implying that if lecturers, were given jobs that require them to learn new things and be creative while at the same time given the opportunity to develop their own abilities, their likelihood of having high strain would be less. This is a small component of the skill discretion scale. Skill discretion is part of control and similarly, is known to exert a moderating effect on job strain (van Der Doef *et al*, 2000). It is not surprising that lecturers, as professionals, enjoy challenging tasks provided they are given the necessary intellectual stimulation. Job dissatisfaction was not an important risk factor for job strain. This is contrary to a study done by Richardsen and Burke (1991) who found that dissatisfaction with various aspects of practice was predictive of stress among Canadian physicians.

Previous research suggested that job dissatisfaction among practitioners had serious implications in terms of patient care (Burke, 1996). Richardsen and Burke (1991) stated that doctors under stress rated their quality of care lower. Similarly, job dissatisfaction in medical lecturers has serious implications for patient care as well as medical education. The prevalence of job dissatisfaction in USM lecturers was 42.6%. Linn *et al* (1985) noted a lower prevalence (5% to 20%). This discrepancy could be due to the increasing demands and challenges in the profession. Table 5 showed that significant associated factors for job dissatisfaction in USM lecturers were decision authority ($p < 0.01$), decision latitude ($p < 0.01$), psychological stressors ($p < 0.01$), job strain ($p < 0.05$), psychological job demand ($p < 0.05$), and depression/life dissatisfaction ($p < 0.01$). After controlling for all significant and biologically plausible variables, the significant and important risk factors were decision authority ($p < 0.001$) and psychological job demand ($p < 0.001$). The final model accounted for 27% of the variance of job dissatisfaction in USM lecturers (Table 6). Decision authority was one of the most significant risk factors of job dissatisfaction in USM lecturers and it had a negative effect. This is consistent with findings by Sargent and Terry (1998) who noted that there is a significant main effect of task control on job satisfaction. Kreuger *et al* (2002) identified decision authority as among the commonest predictors of job dissatisfaction in several health care organizations. Similarly, Van Der Doef *et al* (2000) concluded that decision authority is among the most important predictors of job dissatisfaction. Theorell and Karasek (1996) emphasized that increased control reduces the effects of stressors by allowing individuals to face demands when they are best able to do so in ways they find most acceptable. This clearly meant that decision authority was important for this group of professionals to have perceived job satisfaction. Psychological job demand was a significant risk factor and showed positive association with job dissatisfaction.

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