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

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A cross-sectional study was conducted to determine the prevalence of job strain and association between high job strain and other risk factors with job-related depression in laboratory technicians in Hospital Universiti Sains Malaysia (HUSM) and Kementerian Kesihatan Malaysia (KKM) Hospitals in Kelantan between June 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 was collected by self-administered questionnaire using the validated Malay version of the Job Content Questionnaire (JCQ), originally developed by Robert Karasek based on the Job Strain Model (Karasek, 1979). Results indicated that 27.4 % and 18.3 %, respectively, of laboratory technicians in HUSM and KKM Hospitals experienced stress (high job strain). However, this difference was found to be non-significant (p>0.05). In HUSM, 28.0 % of technicians experiencing high job strain became depressed compared to 32.1 % in KKM Hospitals; however, there was no significant association between high job strain and depression (p>0.05). Risk of depression in laboratory technicians in HUSM was higher in those with active job type (OR 21.26, 95% CI 1.81, 248.52), high job strain (OR 2.69, 95% CI 0.61, 11.85), aged 37 years or more (OR 39.09, 95% CI 2.10, 728.99), and using computers or automated machines (OR 11.36, 95% CI 1.06, 121.58) but lower in those employed less than 125 months (OR 0.04, 95% CI 0.00, 0.74). However, in KKM Hospitals, no significant risk factor for depression was identified. We conclude that more experienced laboratory technicians experiencing higher job strain in HUSM were at higher risk of depression compared to those who were less experienced and lower job strain.

Keywords: Job Strain, Depression, JCQ, Job Strain Model, Laboratory Technicians, HUSM, KKM Hospitals

Job Stress in the Workplace
The Job Strain Model

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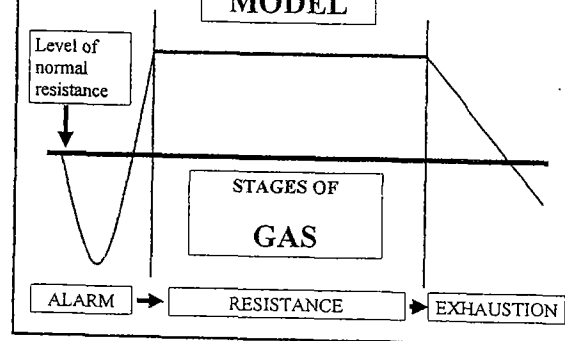USM Health Campus, Kubang Kerian, Kelantan

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- What is Stress?
- What is Job Stress?
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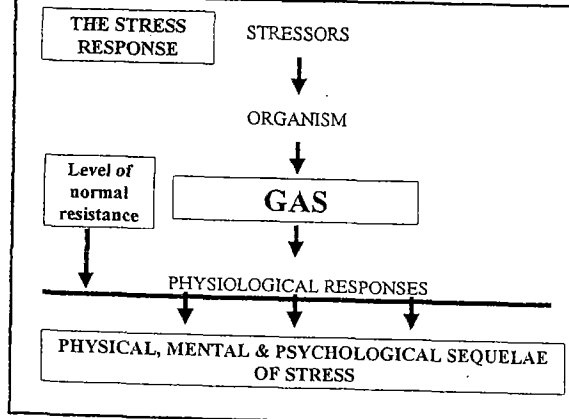- Conclusions and Recommendations

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What is Stress?

- "The result produced when a structure, system, or organism is acted upon by forces that *disrupt equilibrium* or produce strain." (Kenny et al., 2000)
- Defined by Hans Selye in 1974 as "*a syndrome that involves a non-specific response of the organisms to a stimulus from the environment.*" (Seward, 1997)
- The "*non-specific stress response*" is explained by the General Adaptation Syndrome (GAS). (Bailey & Clarke, 1989)

SELYE'S MODEL

Level of normal resistance

STAGES OF GAS

ALARM → RESISTANCE → EXHAUSTION

THE STRESS RESPONSE

STRESSORS

ORGANISM

Level of normal resistance

GAS

PHYSIOLOGICAL RESPONSES

PHYSICAL, MENTAL & PSYCHOLOGICAL SEQUELAE OF STRESS

LAZARUS'S MODEL

STRESSOR

PRIMARY APPRAISAL
Is the event beneficial, threatening, harmful or challenging?
Emotions generated by the appraisal

SECONDARY APPRAISAL
Can I cope with the stress?
What are the alternatives?

Yes, I can cope
Minimum Stress

Sorry, I can't cope
A lot of Stress

What is Job Stress?

- "A perceived imbalance between *occupational demands* and the individual's ability to perform when the consequence of failure is important." (NIOSH, 1999)
- A *mismatch* between *perceived demand* and *perceived ability to cope*. (Swamenathan, 2003)

Impact of Job Stress

- For every 1000 employees, a company would lose £1.6 billion per annum (assuming a gross salary of £20,000/person) (Fletcher, 1991).
- 25% employees claimed that their job is the greatest source of stress in their lives (Fletcher, 1991).
- ILO has estimated that job stress costs employers > $200 billion/year (Greenberg, 1999)
- 34% of 600 employees seriously thought about quitting their jobs due to job stress (Northwestern National Life Insurance Company, 1991).

Impact of Job Stress...

- A 1990 Gallup Poll of a national random sample of employees reported the following effects of job stress:
  - 47% reduced productivity
  - 40% low morale
  - 40% absenteeism
  - 30% alcohol and drug abuse
  - 29% poor work quality
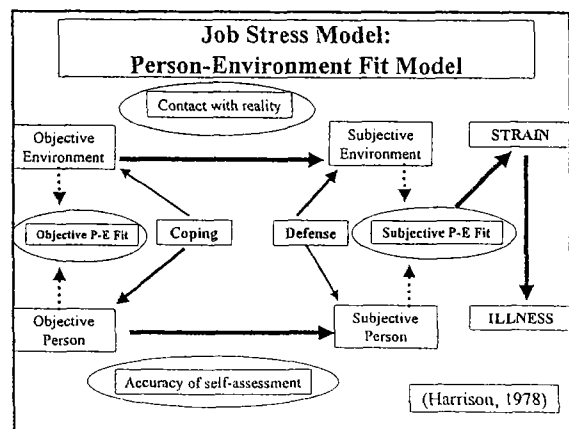 - 28% physical illness
  - 21% job turnover
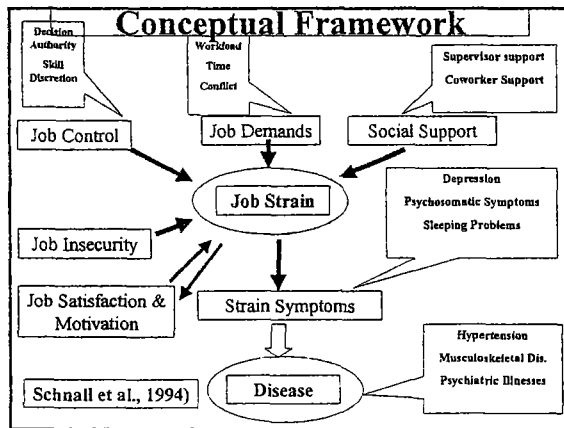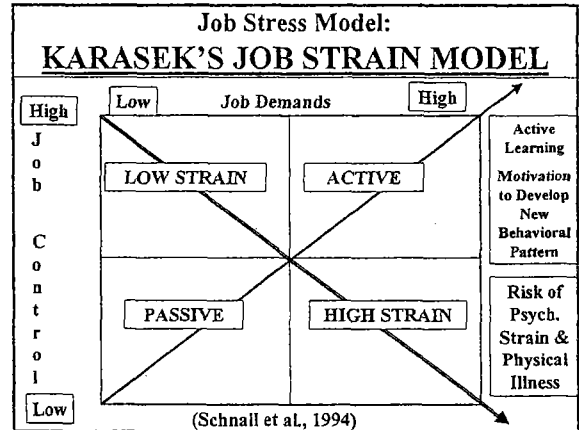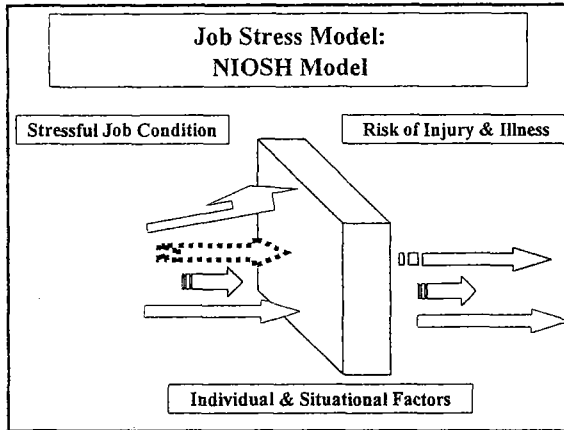 - 21% accidents

(Scott & Jaffe, 1994)

Impact of Job Stress...

- Occupational stressors linked to low job satisfaction and high turnover (Kinman, 2001).
- Work pressure is associated with increased fatigue and burnout (Phoon, 1999).
- Job strain is associated with coronary heart disease and hypertension (Karasek et al., 1998; Schnall, 1998; O'Connor, 2000).
- In Japan, *karoshi* or "sudden death due to overwork" is an important occupational disease (Shimomitsu, 1999).
- In 1987, Japan revised the Labor Standards Law and reduced the statutory working week from 48 to 40 hours.
- Karoshi is also a social problem in Korea now (Haratani & Kawakami, 1999)

Impact of Job Stress...

- Karoshi victims are believed to have logged > 3000 hours of work per year (Mahar, 2000).
- Beside karoshi, cases of *karojisatsu* ("work-related depression leading to suicide") have also been reported (Greenspan, 2000).
- In Korea, 20% of workers reported psychological stress related to work (Rhee, 1999).
- In Singapore, workload, degree of organizational tension, career limitations, and personal constraints were significantly associated with minor illnesses (Woo et al., 1999).
- In Malaysia, only 58.7% of doctors serving with the MOH in Negeri Sembilan were satisfied with their jobs (Sararaks, 1995).

Job Stress Model: Person-Environment Fit Model

(Harrison, 1978)

Slide 1

Job Stress Model: NIOSH Model

| Stressful Job Condition | Risk of Injury & Illness |

Individual & Situational Factors

Slide 2

Job Stress Model: KARASEK'S JOB STRAIN MODEL

High / Low — Job Demands — High

Job Control (High to Low)

	Low Job Demands	High Job Demands
High Control	LOW STRAIN	ACTIVE
Low Control	PASSIVE	HIGH STRAIN

Active Learning, Motivation to Develop New Behavioral Pattern

Risk of Psych. Strain & Physical Illness

(Schnall et aL, 1994)

Slide 3

Conceptual Framework

Decision Authority, Skill Discretion → Job Control

Workload, Time, Conflict → Job Demands

Supervisor support, Coworker Support → Social Support

Job Control, Job Demands, Social Support → Job Strain

Job Strain → Depression, Psychosomatic Symptoms, Sleeping Problems

Job Insecurity

Job Satisfaction & Motivation → Strain Symptoms

Strain Symptoms → Disease

Disease → Hypertension, Musculoskeletal Dis., Psychiatric Illnesses

Schnall et aL, 1994

Slide 4

Job Stress in Malaysia: 4 Studies

- Nurses (HUSM) and Female Clerks (KB) (Harmy, 2001)
- Laboratory Technicians (HUSM & Hospitals, MOH) (Aziah, 2002)
- Lecturers in School of Medical Sciences, USM & Faculty of Medicine, UKM (Huda, 2002)
- Petronas and Proton Workers (Rusli et al, 2003) (*Proposed IRPA PR Research for RM8*)

Slide 5

Job Stress in Malaysia: Study 1

Nurses (HUSM) and Female Clerks (KB)

(Harmy, 2001)

Slide 6

Prevalence of Job Strain in 270 Nurses (HUSM) and 251 Female Clerks (KB) (Harmy, 2001)

Job Strain	Nurses (n=270)		Clerks (n=251)	
	No.	%	No.	%
Low	46	17.0	69	27.5
Passive	94	34.8	79	31.5
Active	66	24.4	49	19.5
High	64	23.7	54	21.5
Total	270	100.0	251	100.0

Prevalence of Job Strain in 270 Nurses in HUSM (Harmy, 2001)						
Job Strain	Clinic		General Ward		Intensive Ward	
	No.	%	No.	%	No.	%
Low	13	30.2	22	14.6	11	14.5
Passive	13	30.2	63	41.7	18	23.7
Active	10	23.3	37	24.5	19	25.0
High	7	16.3	29	19.2	28	36.8*
Total	43	100.0	151	100.0	76	100.0

*p<0.01

Relationships between Job Strain Outcomes and Stressors in 270 Nurses in HUSM: Multiple Linear Regression Analysis		
Job Strain Outcomes	$R^{2\#}$	Stressors (adjusted regression coefficient)
Sleeping Problem	0.064	•Decision authority (-0.088) •Psych. job demand (0.135)*
Depression	0.052	•Job control (-0.119)** •Coworker support (-0.178)**
Job Dissatisfaction	0.205	•Job insecurity (0.232)*** •No. of children at home (-0.146)** •Coworker support (-0.190)***
Psychosomatic Strain	0.127	•Total psychological stressor (0.139)** •Hazardous condition (0.197)** •Job control (-0.142)*
Total Psychological Strain	0.157	•Job control (-0.142)* •Total psychological stressor (0.246)*** •Coworker support (-0.161)*

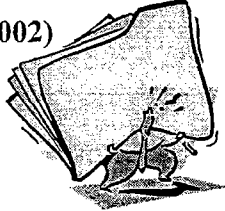All models have been adjusted for age; $^\#$ Coefficient of multiple determination; *, **, ***: p<0.05, <0.01, <0.001

Relationships between Job Strain Outcomes and Stressors in 251 Female Clerks in Kota Bharu: Multiple Linear Regression Analysis		
Job Strain Outcomes	$R^{2\#}$	Stressors (adjusted regression coefficient)
Sleeping Problem		
Depression	0.057	•Job insecurity (0.116) •Toxic exposure (-0.179)**
Job Dissatisfaction	0.162	•Job control (-0.141)* •Coworker support (-0.327)*** •Job insecurity (0.116)
Psychosomatic Strain	0.055	•Job insecurity (0.184)** •Total physical hazard (0.130)*
Total Psychological Strain	0.031	•Job insecurity (0.176)**

All models have been adjusted for age; $^\#$ Coefficient of multiple determination; *, **, ***: p<0.05, <0.01, <0.001

Job Stress in Malaysia: Study 2

Laboratory Technicians (HUSM & Hospitals, MOH)

(Aziah, 2002)

Prevalence of Job Strain in Laboratory Technicians in HUSM (n=84) and KKM Hospitals (n=71) (Aziah, 2002)				
Job Strain	HUSM (n=84)		KKM Hospitals (n=71)	
	No.	%	No.	%
Low	15	17.9	17	23.9
Passive	31	36.9	21	29.6
Active	10	11.9	14	19.7
High	28	33.3	19	26.8*
Total	84	100.0	71	100.0

*χ^2 test; p>0.05

Risk Factors of Job Strain in 84 Laboratory Technicians in HUSM: Multiple Logistic Regression (Aziah, 2002)				
Risk Factors	Crude OR	Adjusted OR	95% CI	P-value
Job Insecurity	1.1	2.4	1.2-5.7	<0.01
Physical Exertion	1.4	1.7	1.1-2.9	0.03
Total Psychological Stressors	1.5	3.6	1.8-7.1	<0.01
Hazardous Conditions	1.1	1.5	0.9-2.1	0.06

Risk Factors of Job Strain in 71 Laboratory Technicians in KKM Hospitals: Multiple Logistic Regression (Aziah, 2002)

Risk Factors	Crude OR	Adjusted OR	95% CI	P-value
Physical Exertion	1.1	1.2	1.1-4.8	0.02
Total Psychological Stressors	1.8	2.5	1.4-4.6	<0.01

Prevalence of Depression in 84 Laboratory Technicians in HUSM and 71 in KKM Hospitals (Aziah, 2002)

Depression	Hospital				P-value
	HUSM (n=84)		KKM (n=71)		
	No.	%	No.	%	
YES	50	59.5	28	39.4	0.016*
NO	34	40.5	43	60.6	

*χ^2 test

Risk Factors of Depression in 84 Laboratory Technicians in HUSM: Multiple Logistic Regression (Aziah, 2002)

Risk Factors	Crude OR	Adjusted OR	95% CI	P-value
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

Risk Factors of Depression in 71 Laboratory Technicians in KKM Hospitals: Multiple Logistic Regression (Aziah, 2002)

Risk Factors	Crude OR	Adjusted OR	95% CI	P-value
Decision Authority				
High	1.0	1.0		
Low	4.5	9.7	1.0-91.1	0.048
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

Job Stress in Malaysia: Study 3

Lecturers in School of Medical Sciences, USM & Faculty of Medicine, UKM

(Huda, 2002)

Prevalence of Job Strain in 73 USM and 80 UKM Medical Lecturers (Huda, 2002)

Job Strain	USM (n=73)		UKM (n=80)	
	No.	%	No.	%
Low	15	20.5	18	22.5
Passive	21	28.8	26	32.5
Active	20	27.4	22	27.5
High	17	23.3	14	17.5*
Total	73	100.0	80	100.0

*χ^2 test; p>0.05

Prevalence of Job Strain in 73 USM (44 Clinical-Based and 29 Non-Clinical-Based) and 80 UKM (51 Clinical-Based and 29 Non-Clinical-Based) Medical Lecturers (Huda, 2002)

Job Strain	Clinical-Based		Non-Clinical-Based	
	No.	%	No.	%
USM				
High	15	34.1	2	6.9*
Low	29	65.9	27	93.1
Total	44	100.0	29	100.0
UKM				
High	9	17.6	5	17.2#
Low	42	82.4	24	82.8
Total	51	100.0	29	100.0

χ^2 test; *p<0.01; # p>0.05

Risk Factors of Job Strain in 73 USM Medical Lecturers: Multiple Logistic Regression (Aziah, 2002)

Risk Factors	Crude OR	Adjusted OR	95% CI	P-value
Department				
Non-Clinical-Based	1.0	1.0		
Clinical-Based	6.9	18.9	1.6-22.7	0.019
Created Skill	0.6	0.4	0.2-0.8	0.008
Psychological Stressors	1.0	1.2	1.0-1.4	0.036

(Cox & Snell R^2 = 0.304)

Risk Factors of Job Strain in 80 UKM Medical Lecturers: Multiple Logistic Regression (Aziah, 2002)

Risk Factors	Crude OR	Adjusted OR	95% CI	P-value
Created Skill	0.6	0.3	0.1-0.9	0.012
Coworker Support	0.3	0.3	0.1-0.9	0.011
Psychological Stressors	1.3	1.2	1.1-1.5	0.007
Job Insecurity	0.8	0.5	0.2-1.2	0.100

(Cox & Snell R^2 = 0.292)

Prevalence of Job Dissatisfaction in 68 USM and 77 UKM Medical Lecturers (Huda, 2002)

Job Dissatisfaction	USM (n=68)		UKM (n=77)	
	No.	%	No.	%
High	29	42.6	33	42.9#
Low	39	57.4	44	57.1
Total	68	100.0	77	100.0

Pearson's χ^2 test; # p≥0.05

Risk Factors of Job Dissatisfaction in 68 USM Medical Lecturers: Multiple Linear Regression Analysis (Huda, 2002)

Variables	β#	SE‡	P-value	R^2†
Decision Authority	-0.0160	0.0	0.000	
Psychological Job Demand	0.0190	0.0	0.000	
Job Strain	-0.1000	0.0	0.073	0.231
Age	0.0039	0.0	0.297	
Gender	-0.0002	0.0	0.996	
Constant	0.1000	0.2	0.193	

Unstandardized regression coefficient
‡ Standard error for regression coefficient
†Coefficient of multiple determination

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Risk Factors of Job Dissatisfaction in 77 UKM Medical Lecturers (Huda, 2002)

Variables	β#	SE‡	P-value	R^2†
Skill Discretion	-0.0250	0.0	0.003	
Psychological Job Demand	0.0190	0.0	0.000	
Supervisor Support	-0.0053	0.0	0.063	0.236
Age	-0.0027	0.0	0.419	
Gender	-0.0072	0.0	0.141	
Constant	0.6100	0.3	0.017	

Unstandardized regression coefficient
‡ Standard error for regression coefficient
†Coefficient of multiple determination.

Job Stress in Malaysia: Study 4

Petronas and Proton Workers
(*Proposed IRPA PR Research for RM8*)
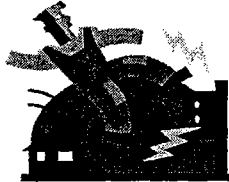
(Rusli et al, 2003)

Job Stress in Petronas & Proton Workers

- RM 8 IRPA PR
- One of 9 Projects under QWL-NORMS-NIP
- Budget: Approx. RM1.2 million
- 3 Years (2003-2005)
- Design: Interventional Prospective
- Output:
  - Prevalence and risk factors of job stress
  - Occupational Stress Information System
  - Stress Reduction Program at Workplaces
  - Paper presentation and publication

Conclusion

- Significant prevalence of job stress in nurses, female clerks, laboratory technicians, and medical lecturers from USM and UKM.
- Different sets of risk factors for different working populations.
- Organizations may need a re-look at existing organizational arrangement.

- Prevention of job stress is an important element of Stress Reduction Program
- Further studies should be supported to explore new dimensions of job stress.