PSYCHOLOGICAL STRAIN AS THE MEDIATOR IN THE RELATIONSHIPS BETWEEN WORK DESIGN AND WORK ATTITUDES AMONG MALAYSIAN TECHNICAL WORKERS

Siti Aisyah Binti Panatik
Faculty of Management and Human Resource Development,
Universiti Teknologi Malaysia, 81310 Johor, Malaysia
sitiaisyah@fppsm.utm.my

Ishak Mad Shah
Faculty of Management and Human Resource Development,
Universiti Teknologi Malaysia, 81310 Johor, Malaysia
ishak@utm.my

Hamidah Abdul Rahman
Faculty of Management and Human Resource Development,
Universiti Teknologi Malaysia, 81310 Johor, Malaysia
midahp@yahoo.com

-Abstract-

Work design has long been found to affect employee well-being, but scholars have begun to question whether the established theoretical relations regarding work design continue to hold given the enormous changes in the nature of work during the past two decades. This study examined the mediation effect of psychological strain on the relationships between work design variables and work attitude outcomes (i.e. job satisfaction, affective commitment, and turnover intentions). This research involved a survey design. Self-reports on the study variables were obtained from 429 technical workers in a large telecommunication company in Malaysia. This study used structural equation modeling (SEM) to assess the mediation effects hypotheses. The findings confirmed the direct effects of job demands and job control on psychological strain. Psychological strain (especially anxiety/depression) functioned as a mediator between work design variables and work attitudes. The findings may help human resource practitioners understand how work design influences employees' well-being.

Key Words: *Psychological strain, job design, job satisfaction, affective commitment, turnover intentions*

JEL Classification: J24 Human Capital; Skills; Occupational Choice; Labor Productivity.

1. Introduction

Work design is widely considered a major determinant of employee well-being and effectiveness (Holman & Wall, 2002). It has been associated with various stress outcomes such as psychological strain (Cooper, Dewe, & O'Driscoll, 2001). Several studies have suggested an association between work design and various aspects of mental health, such as depression, emotional exhaustion, psychological stress, and job satisfaction (e.g., De Jonge et al., 2001; Janssen, De Jonge, & Bakker, 1999; Parker & Wall, 1998; Ylipaavalniemi et al., 2005). This research included two aspects of work design: (1) work context (i.e. job demands) and (2) motivational characteristics (i.e. job control). The level of demands placed on employees and the degree of autonomy or control afforded to employees are significantly related to strain (Karasek & Theorell, 1990). That is, stressful job demands produce high levels of strain, but greater job control can result in lower levels of strain.

This study adopted psychological strain as a key consequence of the psychosocial work environment (e.g. high job demands and low job control). This study also assessed the mediating effects of psychological strain in the relationships between work design and the outcome variables such as job satisfaction, affective commitment, and turnover intentions. This study hypothesised that anxiety/depression (Hypothesis 1a) and social dysfunction (Hypothesis 1b) would mediate the relationships between work design and the work attitude variables. Work design consisted of job demands and the four job control components of timing control, methods control, skill discretion, and decision authority. These variables served as the predictor variables. Psychological strain consisted of anxiety/depression and social dysfunction, which were the predicted mediator variables. Work attitudes (i.e. job satisfaction, affective commitment, and turnover intentions) served as the criterion variables.

2.0 Methodology

2.1 Population and Sample

This study distributed the questionnaire to all technical workers in the target population through internal mail. At the time the data collection commenced, there were about 1100 technical workers in the nineteen branches of Telecom

Malaysia. A total of 452 of the 1100 questionnaires were returned, giving a 41% rate of return. This study dropped nine cases because they had too many missing values, where the respondents did not answer the items relating to job satisfaction, affective commitment, turnover intentions, and job performance. After deleting the outliers, respondents were only 429.

2.2 Instruments

Job demands. This study assessed job demands based on four dimensions, i.e. quantitative demands, attention demands, problem-solving demands, and responsibility demands. This study measured quantitative demands using the scale by Van Yperen and Snijders (2000). In the present study, the Cronbach's alpha for this scale was 0.83. This study used the Wall, Jackson and Mullarkey (1995) scale to measure attention demands among the respondents. The Cronbach's alpha for this scale was 0.73. This study measured problem-solving demands using the Wall, Jackson, and Mullarkey (1995) scale. The Cronbach's alpha for this scale was 0.79. This study also used the Wall, Jackson, and Mullarkey (1995) scale to measure responsibility demands among the respondents. The Cronbach's alpha for this scale was 0.80 at Time 1 and 0.84 at Time 2.

Job control. This study measured job control based on four dimensions, i.e. skill discretion, decision authority, timing control, and method control. This study used the Job Content Questionnaire (JCQ) (Karasek, 1985) to measure skill discretion and decision authority. The Cronbach's alpha for this scale was 0.80 for skill discretion and decision authority. This study used the Wall et al. (1995) scale to measure timing control and method control among the respondents. The Cronbach's alpha was 0.74 for timing control and 0.77 for method control.

Psychological strain. This study chose the 12-item version of the General Health Questionnaire (GHQ-12) by Goldberg and Williams (1988) to measure the feeling of strain among technical workers. The items for GHQ-12 were designed to ask informants about their general level of happiness, experience of depressive and anxiety symptoms, and sleep disturbance. The internal reliabilities of this scale were 0.74.

Job satisfaction. This study employed a 15-item scale developed by Warr, Cook, and Wall (1979) to measure job satisfaction. This scale was designed to measure the satisfaction or dissatisfaction felt by participants in relation to various facets of work (e.g., physical conditions, management, salary, and job security). The scale attempts to measure the degree of satisfaction with intrinsic and extrinsic job components. The present study showed that the Job Satisfaction Scale had a high internal reliability, with Cronbach's alpha of 0.92.

Affective commitment. This study selected the Affective Commitment Scale by Allen and Meyer (1990) to measure affective commitment. The Cronbach's alpha for this scale in the present sample was 0.79.
Turnover intentions. After reviewing several measures, this study chose three items from Mobley, Horner, and Hollingsworth's (1978) scale to measure turnover intentions among technical workers. According to Carmeli and Weisberg (2006), this scale had good reliability (Cronbach's alpha = 0.90). The Cronbach's alpha for turnover intentions in this study was 0.85.

2.3 Structural equation modeling

Following the recommendation by James and Brett (1984), this study employed the structural equation modeling (SEM) approach to test mediation hypotheses. This study performed SEM using the maximum likelihood method with AMOS 18 to test the structural mediation model. The present study tested the fit of the hypothesised mediation models. If the model did not provide an acceptable fit to the data, this study conducted re-specification of the model using modification indices (M.I.), referred to as 'model trimming'. Model trimming is an important step in the elimination of non-significant paths. It is important to trim the insignificant paths to find the one or two most relevant paths in order to improve the structural model. After inspection of the modification indices, this study tested the fit of the final model.

3. Results

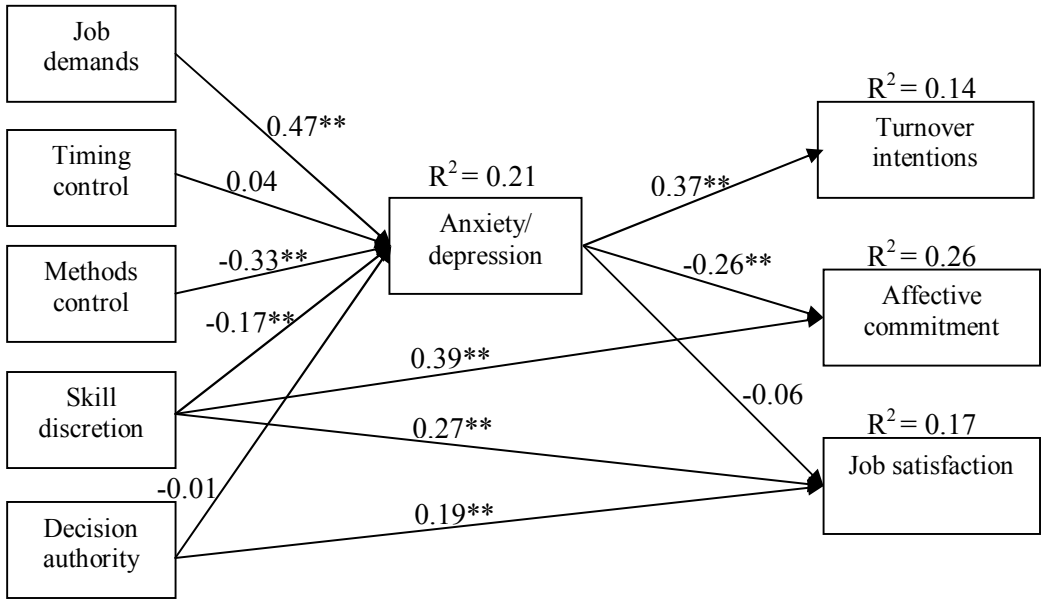
Model A1 (anxiety/depression as a mediator)
Initially, this study assessed the model fit of Model A1 (with anxiety/depression as a mediator). The model fit results, with no modifications, yielded a χ^2/df = 14.4; RMSEA = 0.18; RMR = 0.08; CFI = 0.79; and GFI = 0.87. These results indicate that the model did not fit the data. Accordingly, the researchers modified the model based on the modification indices. The modified Model A1 presented in Figure 2 yielded a reasonable fit ($\chi^2_{(12,\ n=429)} = 28.65$, $p < 0.01$); $\chi^2/df = 2.4$; RMSEA = 0.06; RMR = 0.02; CFI = 0.99; and GFI = 0.99).

Inspection of the modification indices suggested that three new pathways would significantly improve the fit of Model A1. Each added pathway statistically improved the fit of the model and also made logical and conceptual sense given the underlying theory. The new pathways added were a direct path from skill discretion to job satisfaction and affective commitment, and a direct path from decision authority to job satisfaction. This study also tested the direct relationships

between the predictor (i.e. work design) and criterion (i.e. work attitudes) variables without the mediator variable (i.e. anxiety/depression). The results indicated that job demands and methods control were related to affective commitment and turnover intentions. Skill discretion was related to job satisfaction, affective commitment, and turnover intentions. Decision authority was only related to job satisfaction. After included the mediator variable, job demands, methods control, and skill discretion were significantly related to anxiety/depression. In addition, anxiety/depression was significantly related to turnover intentions and affective commitment but not job satisfaction. The following direct effects were also significant: skill discretion with affective commitment and job satisfaction, and decision authority with job satisfaction.

Inspection of the modification indices suggested that three new pathways would significantly improve the fit of Model A1. Each added pathway statistically improved the fit of the model and also made logical and conceptual sense given the underlying theory. The new pathways added were a direct path from skill discretion to job satisfaction and affective commitment, and a direct path from decision authority to job satisfaction.

Figure 2. Modified Model A1 at Time 1 with standardised parameter estimates



Note. ** $p < 0.01$

This study also tested the direct relationships between the predictor (i.e. work design) and criterion (i.e. work attitudes) variables without the mediator variable (i.e. anxiety/depression). The results indicated that job demands and methods control were related to affective commitment and turnover intentions. Skill discretion was related to job satisfaction, affective commitment, and turnover intentions. Decision authority was only related to job satisfaction. After included the mediator variable, job demands, methods control, and skill discretion were significantly related to anxiety/depression. In addition, anxiety/depression was significantly related to turnover intentions and affective commitment but not job satisfaction. The following direct effects were also significant: skill discretion with affective commitment and job satisfaction, and decision authority with job satisfaction.

The main purpose in this analysis was to test the specific mediation effects of anxiety/depression in the relationships between work design and the criterion variables (i.e. job satisfaction, affective commitment, and turnover intentions). Therefore, this study examined the direct effect, indirect effect, and total effect statistics in order to test these specific mediation effects. The results show that six mediation effects of anxiety/depression at Time 1 were significant from the 15 mediation routes tested in this analysis. Specifically, the indirect effects of anxiety/depression were significant in the relationships between job demands and affective commitment, and between job demands and turnover intentions. These results demonstrate that anxiety/depression fully mediated the relationships between job demands and affective commitment and turnover intentions. However, anxiety/depression did not mediate the relationships between job demands and job satisfaction. The results also show that the indirect effects of anxiety/depression were significant in the relationships between methods control and affective commitment, and turnover intentions. Anxiety/depression fully mediated the relationships between methods control and affective commitment, and turnover intentions. However, anxiety/depression did not mediate the relationships between methods control and job satisfaction.

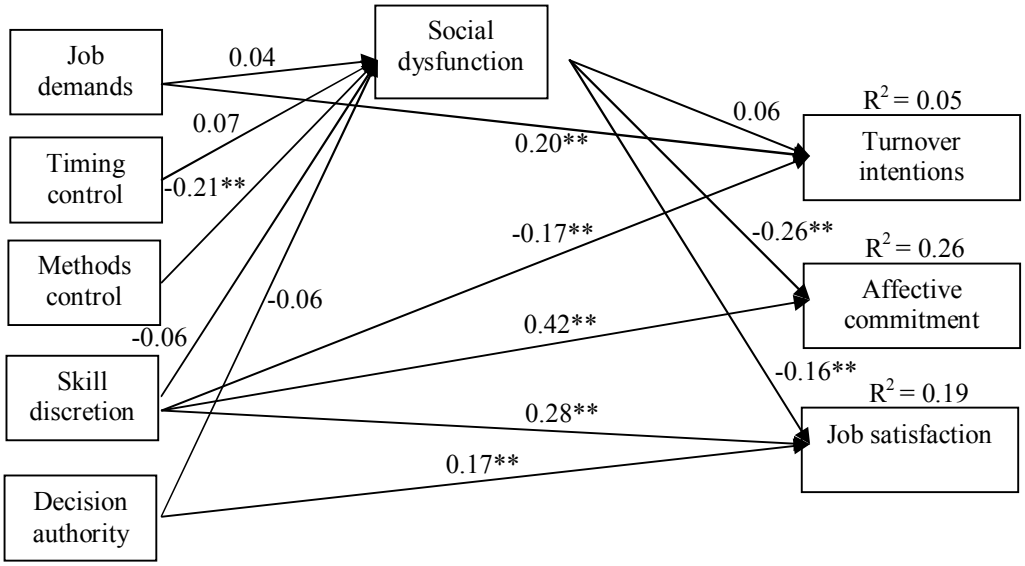
The indirect effects of anxiety/depression were also significant in the relationships between skill discretion and affective commitment, and turnover intentions. These results reveal that anxiety/depression fully mediated the relationships between skill discretion and turnover intentions, and partially mediated the relationships between skill discretion and affective commitment. Anxiety/depression did not mediate the relationships between skill discretion and job satisfaction. The results

also show that anxiety/depression did not mediate the relationships between timing control and any of the criterion variables. Also, anxiety/depression did not mediate the relationships between decision authority and any of the criterion variables.

Overall, the mediation tests for Model A1 indicated that anxiety/depression operated as a mediator in many of the relationships between work design and the criterion variables. Anxiety/depression mediated the impact of job demands, methods control, and skill discretion on affective commitment and turnover intentions, but not job satisfaction. These results provide some support for Hypothesis 1a that anxiety/depression could function as a mediator in the relationships between work design and the criterion variables.

Model A2 (social dysfunction as a mediator)
This study also tested the model fit for Model A2 (with social dysfunction as a mediator). The results yielded a $\chi^2/df = 16.3$; RMSEA = 0.19; RMR = 0.08; CFI = 0.74; and GFI = 0.86, indicating that the model did not fit the data. Inspection of the modification indices suggested that five added new direct pathways would significantly improve the model fit. Figure 3 presents the modified Model A2. The modified Model A2 yielded a reasonable fit ($\chi^2_{(10,\ n=429)} = 27.87$, $p < 0.01$); $\chi^2/df = 2.8$; RMSEA = 0.06; RMR = 0.02; CFI = 0.98; and GFI = 0.99).

Figure 3. Modified Model A2 with standardised parameter estimates



Note. ** p < 0.01

Each added pathway statistically improved the fit of the model and also made both logical and conceptual sense given the underlying theory. The new pathways added in Model A2 were a direct path from job demands to turnover intentions, a direct path from decision authority to job satisfaction, and three direct paths from skill discretion to job satisfaction, affective commitment, and turnover intentions. Before tested the specific mediating relationships, this study test the relationships between the predictor and criterion variables without the mediator variable. The results indicated that job demands were directly related to turnover intentions. Methods control was related to job satisfaction and affective commitment. Skill discretion was related to job satisfaction, affective commitment, and turnover intentions. Decision authority was only related to job satisfaction. The primary aim in this analysis was to test the specific mediation effects of social dysfunction in the relationships between work design and the criterion variables.

Only two mediation effects of social dysfunction were significant from the 15 mediation routes tested in this analysis. Specifically, the indirect effects of social dysfunction were significant in the relationships between methods control and job satisfaction and affective commitment. The results demonstrate that social dysfunction fully mediated the relationships between methods control and both job satisfaction and affective commitment. However, social dysfunction did not

mediate the relationships between methods control and turnover intentions. The results also show that social dysfunction did not mediate the relationships between: job demands and any of the criterion variables; timing control and any of the criterion variables; skill discretion and any of the criterion variables; and decision authority and any of the criterion variables.

To conclude, the mediation tests of Model A2 provide only little support for Hypothesis 1b that social dysfunction would function as a mediator in the relationships between work design and the criterion variables. Social dysfunction only mediated the relationships between methods control and the criterion variables of job satisfaction and affective commitment.

4. Discussion and Conclusion

The current study provides some support for psychological strain as a mediator of the relationships between work design and the criterion variables. In brief, the cross-sectional analyses indicated that psychological strain functions as a mediator in the relationships between work design and work attitude outcomes (i.e. job satisfaction, affective commitment, and turnover intentions). The cross-sectional analyses illustrated that anxiety/depression mediated the relationships between job demands, methods control, and skill discretion with job satisfaction, affective commitment, and turnover intentions. Social dysfunction only mediated the relationships between methods control with job satisfaction, affective commitment, and turnover intentions. The key finding of the current study is that anxiety/depression works better as a mediator than does social dysfunction. These results seem to suggest that the work design variables are more likely to affect anxiety/depression than social dysfunction. For example, the current study found that job demands, timing control, methods control and skill discretion were more strongly related to anxiety/depression than social dysfunction, which in turn affects job satisfaction, affective commitment, and turnover intentions.

This study corroborates previous studies that job demands and job control appear to first negatively influence strain (e.g., anxiety/depression), which then results in reduced levels of job satisfaction, affective commitment and increased levels of turnover intentions (Podsakoff, LePine, & LePine, 2007; Stewart & Barling, 1996). One possible explanation for these results is that higher levels of job demands and lower levels of job control variables result in decreases in cognitive energy, confidence, and task persistence and these signs of anxiety/depression affect work attitudes – for example, job satisfaction, affective commitment and

turnover intentions. Lazarus and Folkman (1984) also suggested that work stressors (e.g., stimuli that place demands on individuals) are appraised as hindrances, and result in strain. Consistent with expectancy theory (Vroom, 1965), the results of this appraisal translate to differing effects on work attitudes such as job dissatisfaction, lack of commitment and high turnover intentions. Also, the conceptualisation of anxiety/depression and social dysfunction may be responsible for these findings. As stated earlier, anxiety/depression reflects a broader dimension such as being unhappy and depressed whereas social dysfunction reflects only a social aspect of strain. As a result, job demands and job control may be more related to anxiety/depression rather than to social dysfunction.

The current research has several major implications for human resource management practitioners. First, the results suggest that work design aspects (e.g., job demands and job control) were related to persistent strain among employees. Thus, care should be taken by human resource management practitioners to "fit" a work environment to their occupants. Job demands and job control provide a useful basis for redesigning jobs in order to enhance well-being among employees. The current study revealed that high job demands were associated with psychological strain. Based on these findings, managers should be alert for signs of employees suffering from high job demands. Symptoms of high job demands may include absence from work, being late for appointments, missing deadlines, being mistake prone, or undergoing a noticeable change of appearance (Cummings, 2001). When these symptoms appear, management interventions, such as talking the issues out with employees, are likely to be beneficial. Talking regularly with employees about job demands and helping them to prioritize tasks may ultimately result in greater productivity. Careful scheduling of all activities an individual needs to accomplish, including personal quality time, may help facilitate productivity and, at the same time, reduce perceptions of high job demands.

References

Allen, N. J., & Meyer, J. P. (1990). The measurement and antecedents of affective, continuance and normative commitment to the organization. *Journal of Occupational Psychology, 63*, 1-18.

Carmeli, A., & Weisberg, J. (2006). Exploring turnover intentions among three professional groups of employees. *Human Resource Development International, 9*(2), 191-206.

Cooper, C. L., Dewe, P. J., & O'Driscoll, M. P. (2001). *Organizational stress: A review and critique of theory, research and application.* Thousand Oaks, CA: Sage.

Cummings, B. (2001). Sales ruined my personal life. *Sales and Marketing Management, 153*, 44-51.

De Jonge, J., Dormann, C., Janssen, P. P. M., Dollard, M. F., Landeweerd, J. A., & Nijhuis, J. N. (2001). Testing reciprocal relationships between job characteristics and psychological well-being: A cross-lagged structural equation model. *Journal of Occupational and Organizational Psychology, 74*, 29-46.

Goldberg, D., & Williams, P. (1988). *GHQ: A user's guide to the General Health Questionnaire.* Windsor: NFER/Nelson, Windsor.

Holman, D. J., & Wall, T. D. (2002). Work characteristics, learning-related outcomes, and strain: A test of competing direct effects, mediated, and moderated models. *Journal of Occupational Health Psychology, 7*(4), 283-301.

James, L. R., & Brett, J. M. (1984). Mediators, moderators, and tests for mediation. *Journal of Applied Psychology, 69*(2), 307-321.

Janssen, P. P. M., De Jonge, J., & Bakker, A. B. (1999). Specific determinants of intrinsic work motivation, burnout and turnover intentions: A study among nurses. *Journal of Advanced Nursing, 29*, 1360-1369.

Karasek, R. A. (1985). *Job Content Questionnaire.* Los Angeles: Department of Industrial and Systems Engineering, University of Southern California.

Karasek, R. A., & Theorell, T. (1990). *Healthy work: Stress, productivity, and the reconstruction of working life.* New York: Basic Books.

Mobley, W. H., Horner, S. O., & Hollingsworth, A. T. (1978). An evaluation of precursors of hospital employee turnover. *Journal of Applied Psychology, 63*(4), 408-414.

Parker, S. K., & Wall, T. D. (1998). *Job and work design: Organizing work to promote well-being and effectiveness*. Thousand Oaks, London: Sage Publications.

Podsakoff, N. P., LePine, J. A., & LePine, M. A. (2007). Differential challenge stressor-hindrance stressor relationships with job attitudes, turnover intentions, turnover, and withdrawal behavior: A meta-analysis. *Journal of Applied Psychology, 92*(2), 438-454.

Stewart, W., & Barling, J. (1996). Daily work stress, mood and interpersonal job performance: A mediation model. *Work and Stress, 10*, 336-351.

Van Yperen, N., & Snijders, T. A. M. (2000). A multilevel analysis of the demands-control model: Is stress at work determined by factors at the group or at the individual level? *Journal of Occupational Health Psychology, 5*, 182-190.

Vroom, V. (1965). *Motivation in management*. New York: American Foundation for Management Research.

Wall, T. D., Jackson, P. R., & Mullarkey, S. (1995). Further evidence on some new measures of job control, cognitive demand and production responsibility. *Journal of Organizational Behavior, 16*, 431-455.

Warr, P., Cook, J., & Wall, T. (1979). Scales for the measurement of some work attitudes and aspect of psychological well-being. *Journal of Occupational Psychology, 52*, 129-148.

Ylipaavalniemi, J., Kivimaki, M., Elovainio, M., Virtanen, M., Jarvinen, L. K., & Vahtera, J. (2005). Psychosocial work characteristics and incidence of newly diagnosed depression: A prospective cohort study of three different models. *Social Science & Medicine, 61*, 111-122.