

# Occupational stress in clinical nurses.

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**Authors:**

[Lu, Luo](#)

[Shiau, Chi](#)

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## HEALTH AND HUMAN RESOURCES

Examines occupational stress in clinical nurses working in various hospitals in Taiwan. Development of the Occupational Stress Indicator (OSI); Reliability of the OSI; Comparison of the nurses' OSI scores with industrial workers; Correlation analysis.

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## OCCUPATIONAL STRESS IN CLINICAL NURSES

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### RESEARCH REPORT

#### ABSTRACT

The present study was based on an integrative work stress model proposed by Cooper and his associates (Cooper et al., 1988), which focused on stress perception and outcomes, as well as potential moderating variables such as personality and coping efforts. Specifically, this article examines occupational stress in clinical nurses who worked in various hospitals in southern Taiwan. When compared with Chinese industrial white and blue-collar workers, nurses experienced higher work stress, more physical and mental ill-health, lower job satisfaction, and also made more efforts to cope with work stress. There were also some interesting differences in types of stressors experienced by nurses and industrial workers.

#### Introduction

Stress has become one of the most serious health issues of the twentieth century—a problem not just for individuals in terms of physical and mental disability, but for employers and governments who have started to assess the financial consequences of work stress (ILO, 1993). Matteson and Ivancevich (1987) estimate that stress causes half of absenteeism, 40% of turnover, and that 5% of total workforce covers for reduced productivity due to preventable stress (\$300 billion for US economy annually). Although other sources of references quote different figures, it is obvious that occupational stress has serious consequences for both individual employees and organizations.

Health care professionals have long been regarded to have high risk for developing stress-related problems as they face particular stressors that are not part of most other occupations (Calboun & Calboun, 1983; Payne & Firth-Cozens, 1987). Nursing, which is the largest profession in health care services, is now facing a

tremendous challenge in Taiwan. Clinical nurses in particular, are experiencing serious problems of high job turnover, and more are leaving the nursing profession. Consequently, human power shortage, deteriorating quality of nursing services, lack of public recognition and appreciation are interacting to form a vicious circle. Understanding the occupational stress experienced by clinical nurses may help us better protect the health of those concerned, as well as breaking the vicious circle of high stress-high turnover-high shortage.

The extensive literature on stress at work demonstrates that stressors are many and varied. In one study that surveyed clinical nurses in medical centres in northern Taiwan, Wu (1994) identified six categories of work stressors: 'managerial stress', 'nursing stress', 'interpersonal stress', 'work environment stress', 'role identity stress' and 'routine work stress'. Other stressors experienced by clinical nurses may include conflicts between home and work (especially for those married women with young children to care), frustration and disappointment with organizations and managerial processes, and all the stressors associated with working with and caring for other people.

However, any list of stressors will not affect everyone in the same way. Researchers (Lu, 1989; Rice, 1992) have regarded coping as the most relevant moderator in the stress-strain relationship. Coping is generally seen as various cognitive and behavioural efforts made to master, tolerate or reduce demands that tax or exceed a person's resources (Cohen & Lazarus, 1976; Pearlin & Schooler, 1978). There is now a reasonably strong consensus among researchers that this conceptualization of coping is an adequate framework to adopt. It was, indeed, the definition used in this present research.

A large number of coping strategies and various typologies have been suggested, the dichotomy of problem-focused versus emotion-focused coping is no doubt the most popular (Lazarus & Folkman, 1984). Recently, some researchers have advocated that seeking support should be regarded as an independent category of coping (Thoits, 1986; Lu & Chen, 1996), since it is inter-personal oriented, whereas both problem- and emotion-focused coping are mainly intra-personal oriented. Furthermore, social support can be either cognitive or behavioural, and can help to either solve the problem or manage the emotion. Therefore, in this study, problem-focused, emotion-focused, and seeking social support will all be measured as coping strategies to examine their potential moderating effects on the stress-strain relationship.

When stressors are present, people will use various coping strategies, both cognitive and behavioural to alleviate their impact (Folkman & Lazarus, 1980). Much evidence has confirmed that both the effectiveness of coping and the wideness of coping repertoire are related to better health (Lazarus, 1993). Looking at the effectiveness of a particular coping strategy (or a broad category of coping strategies), a far more complicated picture emerged. For example, denial as a coping method was found to be very effective in the short-term, but quite maladaptive in the long run (Levine, 1987). To clarify this issue, a context-specific approach must be adopted, which can reveal the dynamics of the stressor and coping processes. However, this was not the focus of the present study.

Apart from coping, can other factors exacerbate or ameliorate the impact of stress on human adjustment? In an integrative structural model proposed by Cooper and his associates (Cooper & Baglioni, 1988; Cooper et al., 1988), the impact of work stressors is moderated by individual personality characteristics (Type A behaviour pattern, Locus of control) and coping strategies. The strain effects on individuals may be manifestations of mental or physical ill-health, and a lowered job satisfaction; the effects of stress for organizations may include high absenteeism, high job turnover, low efficiency, poor performance, high accidents and low staff morale. The original model presented in Fig. 1, was then used to develop the Occupational Stress Indicator (OSI).

The first author recently adopted this widely used diagnostic instrument OSI (Cooper et al., 1988), and established a normative sample consisting of 1 054 public sector industrial workers in Taiwan (Lu et al., 1995a). The purpose of this study was twofold: (a) to replicate the reliability study of the Chinese OSI on a non-industrial sample, to examine its cross-occupational consistency; (b) to examine whether clinical nurses experience more occupational stress than those working in non-health care industries.

Since there had been some evidence that both the Type A behaviour pattern and locus of control measures in the OSI needed revision and reworking before applying directly to the Chinese culture (Lu et al., 1995b; Lu et al., in press), this study concentrated on the stressors, strain and coping measures of the OSI, which had shown good reliability and validity in the above mentioned research.

## **Methods**

### **Subjects**

Respondents in this study were clinical nurses attending a part-time undergraduate degree course at Kaohsiung Medical College. All 100 nurses were contacted at class, and 89 returned valid questionnaires. After excluding those who mainly perform teaching duties in clinical settings, a sample of 84 was used for all statistical analyses reported in this article. Further description of the sample will be provided later.

The industrial workers with whom nurses in the present study were compared, came from four major state-owned companies in manufacturing and power industries. All companies are located in the southern city of Kaohsiung, which is the biggest industrial centre in Taiwan. Subjects were randomly selected from the employees lists provided by the companies, and the final valid sample of 1 054 workers was quite equally drawn from the four companies, with about equal numbers of white- and blue-collar workers. Over half of the sample were 36-45 years old, married, and had served at the same organization for 11-20 years, reflecting low labour turnover and high job security in the public sector. Nearly half of the sample had some college education, reflecting the high quality of this labour force. Finally, due to the nature of the industries under study, an overwhelming majority of our sample were males, with only 66 female workers. Overall, this sample was quite representative of the public sector employees in Taiwan.

### **Measures**

The revised Chinese version of The Occupational Stress Indicator (OSI) was implemented, which measures five major aspects of occupational stress, with 6-point scales. These measures include one independent variable, one moderating factor, and three dependent variables, as follows:

Independent variable--Stressors (57 items). Previous research, Lu et al., 1995b, using principle components technique had identified four subscales: 'Role conflicts & lack of support', 'Lack of job security & home/work conflicts', 'Job itself & problems of career development', and 'Stress of managerial role'.

Moderating factor--Coping strategies (21 items). The same research quoted above had identified three subscales: 'Rational problem solving', 'Restructuring & seeking support', and 'avoidance'.

Dependent variables. (a) physical health (12 items); (b) mental health (18 items); (c) job satisfaction (22 items). The same research quoted above had identified four subscales: 'Job & personal growth', 'Personal ambition & organizational

communication', 'Personal identification with job & organization', and 'Interpersonal relationships at work'.

Reliability and validity of the original OSI for the UK workers including health services workers are widely available and of a high standard (Cooper et al., 1988; Rees & Cooper, 1992). Those of the revised Chinese OSI are also fairly good (Lu et al., 1995a).

## **Results and discussion**

### **Sample demographics**

All subjects in this study were females, and between 23-41 years old. Among them, 13.1% were between 20-25 years old, 70.2% were between 25-30 years old, 14.3% were between 30-35 years old, and 2.4% were over 35 years old. All except one subject had junior college education. Over half of them (64.3%) were single, and the rest married. Just over half (52.8%) worked in medical centres, 47.2% worked in regional and district hospitals, and another 13.9% worked in clinics. Among these workplaces, 63.9% were public and 36.1% were private enterprises. The largest proportion of nurses in this study (43.2%) had worked in the same organization for 3-5 years, a lesser proportion (24.7%) had worked for less than 3 years, and 32.1% had worked for over 5 years. Overall, this sample represents a typical profile of clinical nurses in Taiwan: young, single females with junior college qualifications in nursing, and a relatively brief work experiences.

### **Reliability of the OSI**

The first purpose of this study was to replicate the reliability evidence of the Chinese OSI in a non-industrial sample. Internal consistency reliability using Cronbach's alpha was computed for all relevant scales and subscales. The Job satisfaction scale had an alpha of .92, and .65-.82 for its four subscales; the Physical ill-health scale and Mental ill-health scale had alphas of .81 and .84; the Stressors scale had an alpha of .95, and .67-.91 for its four subscales; the Coping scale had an alpha of .77, and .52-.75 for its three subscales. Table I listed Cronbach's alphas for all the OSI scales and subscales used in the present study. Overall, these reliability coefficients were acceptable, but somewhat lower than those for the Chinese industrial workers. It seems that these five scales in the Chinese OSI have shown comparable reliability of a high standard across occupations, and it should encourage further use of the OSI as a general purpose assessment tool in diverse occupational work settings. However, due to insufficient sample size, this study was not able to replicate factor structures identified with

industrial workers. Future studies employing large samples should look at the structural consistency or comparability of the OSI across occupations. Such evidence would further facilitate comparisons of stress and strain between different occupational groups.

### **Occupation stress: nurses versus industrial workers**

The second purpose of this study was to conduct controlled comparisons, hence, OSI scores of clinical nurses were compared with those of Chinese industrial workers. Results are presented in Table II. As we can clearly see that nurses experienced higher work stress, more physical and mental ill-health, lower job satisfaction, and also made more efforts to cope with work stress. All these inter-group differences had reached high statistical significance. This finding was largely consistent with previous findings (Payne & Firth-Cozens, 1987; Rees & Cooper, 1992).

The issue of gender must be discussed here. There is a body of literature showing gender differences in mental health (Verbrugge, 1985; Campbell et al., 1992), with a female preponderance in psychological ill-health, most frequently depressive illness. With regard to stressors, research has also found that women tend to perceive more stressors, and report higher levels of distress as a result (Aneshensel et al., 1981; Sowa & Lustman, 1984). In Taiwan, as in many industrialized countries, the vast majority of nurses are women and industrial workers men, although the latter is in the process of changing, especially in the private sectors. Could it be possible, then, that the differences we found between nurses and industrial workers were, at least, partly caused by the prevailing gender differences in reporting stressors and strain?

We repeated our nurses--industrial workers comparisons, using only the 66 female workers in the later group. These females workers were all white-collar employees, in lower rank administrative posts; otherwise, they were not different from the larger sample of industrial workers in any aspects, such as age, education, and seniority. Means, standard deviations, and t values for differences between clinical nurses and female industrial workers are presented in the last three columns of Table II. As we can see, those differences were again all highly significant, and very similar to those between clinical nurses and industrial workers at large.

Therefore, considering the uniformity and large magnitude of these differences between clinical nurses and industrial workers, it is unlikely that gender would be fully responsible. In other words, taking into account of possible gender differences,

clinical nurses may still experience higher levels of work stress, engage in more coping of every kind, suffer from poorer health and lower job satisfaction, than their counterparts in industries.

We then took a more detailed look at the individual stress and strain measurement of the OSI.

On the stress(ors) side, a more detailed analysis was conducted to compare lists of the most salient stressors for nurses and industrial workers. The top ten stressors along with their ranking orders and percentage of respondents complaining are presented in Table III.

As we can see, significantly more nurses complained about each stressor as compared to workers, and there were only four common stressors between the two lists. It is more revealing looking at differences in stressors between the two occupational groups. For clinical nurses, there were two particular types of stressors. First, lack of social support from both supervisors and colleagues is a rather stressful aspect of nursing work. In the medical systems, nurses are usually expected to play the role of assistant to doctors and the role of coordinators between doctors and patients, medical staff and administrators. However, insufficient support and delegation often leave them in conflicts and isolation. Hence, there certainly is a necessity to build, and to facilitate worksite support and improve interdisciplinary cooperation.

The second cluster of stressors for nurses were basically task-related. Working long hours, possibly rotating shifts is an intricate part of the nursing work, but usually quite stressful for most people, psychologically and physically. Task conflicts mainly arise from intimate contacts with the patient and at the same time having to carry out doctors' instructions, which may cause pain and discomfort for the patient. They may also arise from nurses' coordinating responsibilities between the 'cure' priority (performed by doctors) and 'cost' priority (performed by hospital administrators). In addition, worries over taking risks, from minor infections to AIDS contamination, over possible mistakes one may commit, are unique stressors for health care workers, especially for nurses delivering treatments and caring for patients in the forefront. Hence, strong support and adequate on job training should be activated to alleviate undue concerns and emotional distress of clinical nurses. On the strain side, the OSI does not provide cut-off scores to distinguish those with clinically significant mental and physical problems from others. One way of doing this is to compare the obtained scores of current state of health among nurses with

those of patients with psychoneurotic problems. Some OSI data have been collected from patients attending departments of clinical psychology with problems of anxiety and depression (Rees & Cooper, 1992). The preliminary data provide a mean mental ill-health score of 77.11 (SD = 13.64) and physical ill-health score of 45.38 (SD= 10.25). Unfortunately, more detailed information about the demographics and psychiatric status of these patients were not available in the original paper.

If 'caseness' is defined by nurses scoring higher than the mean score obtained by patients, 8.9% of our sample (approximately one in eleven) would be cases on the basis of mental ill-health scores, 24.4% (approximately one in four) on physical ill-health scores. Therefore, nurses not only reported high mental and physical ill-health, a very substantial proportion of them had levels of either mental or physical ill-health OSI scores that match the average levels of patients with psychoneurotic problems.

Collaborative evidence also came from a recent study on 301 clinical nurses in the same city in Taiwan (Wu, 1995). These nurses were randomly chosen from a medical centre, and were quite comparable to the present nurses sample in demographics. Using CES-D (Redloff, 1977) to measure depressive symptomatology, those nurses showed inflated scores (Mean = 14.62, SD = 8.79), already within the range of high risk groups (usually defined as exceeding score of 14 or 15 on the CES-D). Although medical sociologists have argued that symptoms are not the only predictor of who will become a patient, undoubtedly clinical nurses are at particularly high risk, who may require specialist help.

### **Correlation analysis**

Following the above descriptive analyses, we further attempted correlation analysis to reveal the inter-relationships between stress, moderating variables, and adjustment outcomes. Pearson correlation coefficients were then computed, between stress, coping, job satisfaction, physical and mental health. For easy comparisons, the top diagonal in Table IV represents the matrix for the industrial workers, whereas the bottom diagonal represents that for the clinical nurses.

Since the small sample size would hinder the statistical power of correlation analysis, caution must be exercised in interpreting the matrix results, especially those failed to reach significance levels. Nonetheless, correlations between stressors and physical ill-health, job satisfaction and psychological ill-health, as well as the two measures of ill-health did reach statistical significance, and were in

directions expected. Comparing the top diagonal (industrial workers) with the bottom diagonal (nurses), we noticed three out of four pairs of correlations involving stressors failed to reach significance, but did otherwise in the much larger sample of industrial workers, although magnitudes of these coefficients were still small. This served to further underline the issue of individual differences raised earlier. In other words, the relationship between stressors and health is unlikely a direct one, more likely, it may be moderated by various psychological (such as personality and coping), and social factors (such as organizational climate and support).

### **Regression analysis**

As both the theoretical model underlying the OSI and the above reported correlation results suggested a possible indirect relationship between stress and outcomes, we then attempted to examine the hypothesized moderating effect of coping on health and job satisfaction. This moderating effect can also be depicted as the stress-buffering effect, namely, the beneficial effect of coping would vary across levels of stress. Coping is progressively more effective in ameliorating the harmful impact of job stress; the strongest buffering effects occur at high levels of stress. Within a regression framework, such stress-buffering effects are estimated by the inclusion of product-moment interaction terms (i.e. stress-coping) in hierarchical models.

In contrast to the stress-buffering hypothesis, coping can also perform as a stress-suppressor (Lu, 1989), namely, the relationship between stress, coping and well-being is linear in this instance. Effects of coping depend on the level of stress; as stress increases, individuals are motivated to adopt more coping strategies and to assert more efforts. Thus, whereas stressors erode personal well-being, coping may compensate for these negative effects. Within a regression-framework, such stress-suppression effects are represented by main effects of coping in hierarchical models.

Consequently, a series of hierarchical regression analyses were conducted to estimate both main effects and interactive effects of coping on (a) job satisfaction, (b) physical health, and (c) psychological health. The same procedure was repeated for total coping and its three subscales. Among the 12 models estimated, two interactions and one main effect of coping reached statistical significance. The interaction between total coping and stress ( $B = 1.93, p < .05$ ), as well as that between "restructuring & seeking support" and stress ( $B=3.46, p < .01$ ) significantly ameliorated the impact of stress on psychological health. On the other hand,

'avoidance' suppressed the aversive effect of stress on physical health (Beta = 1.85,  $p < .01$ ). The amount of variance explained by these models was moderate: 9%, 15% and 16% respectively.

With a relatively small sample size, it is unwise to interpret the nonsignificant results as disconfirming of a particular hypothesis, rather, more rigorous research should be encouraged, either working with a larger independent sample, or attempting to control for possible confounds, for instance, negative affectivity in this case. On the other hand significant results obtained with a small sample can be very powerful supporting evidence for a particular hypothesis.

In this study, we found evidence to support both the stress-buffering and stress-suppressing hypothesis, albeit only 3 out of 12. It seemed that coping directed at 'restructuring cognition' about a situation or 'seeking external support' could serve as stress buffers, possibly because people would only be motivated to attempt these coping strategies when the stress level is high. Otherwise, restructuring is not necessary, and crying wolves would unduly strain the work relationships. Interestingly, 'avoidance' as a coping strategy served as a stress-suppressor, which was inconsistent with its usual conceptualization as a maladaptive measure (Lazarus, 1993). However, a moderate use of avoidance might be helpful in work settings, especially for clinical nurses, for whom team cooperation and harmony are both desirable and necessary. Of course, these possibilities are worthy of further rigorous research, especially within the nursing profession, since empirical evidence is sketchy to date.

## **Conclusions**

This study has replicated a fairly good reliability for the Stressors, Coping strategies, Job satisfaction, Physical ill-health, and Mental ill-health scales in a sample of clinical nurses. Both stress-buffering and stress-suppression effects of coping were found regarding physical and psychological health, which partly supported the theoretical framework underlying the OSI. Overall, these results have lent some support for the usability of the OSI across occupations. Nonetheless, future studies are needed to accumulate more evidence of reliability, and more importantly validity of the OSI in different occupations.

This study has also found that compared to industrial workers, clinical nurses experienced higher work stress, more physical and mental ill-health, lower job satisfaction, and also made more efforts to cope with work stress. There were some specific types of stressors experienced by nurses, mainly lack of support and task-

related stressors. These results confirmed that clinical nursing is indeed a high stress, high risk occupation, and some specific needs and concerns of nurses should be addressed in future stress management programmes.

Correspondence to: Dr. Luo Lu, Graduate Institute of Behavioural Sciences, Kaohsiung Medical College, No. 100 Shih-Chuan 1st Road, Kaohsiung City 807, Taiwan, ROC.

### **FIG. 1. The original OSI structure**

Type A control

#### **Stressors**

- Intrinsic to the job
- Management role
- Relationships with others
- Career & achievement
- Organizational structure and climate
- Home/work interface

#### **Health**

- Physical
- Psychological

#### **Job satisfaction**

- Achievement, value & growth
- Job itself
- Organizational design and structure
- Organizational process
- Personal relationships

#### **Coping**

- Social support
- Task strategies
- Logic
- Home/work relations
- Time management
- Involvement

### **TABLE I. Cronbach's alphas for scales in the OSI**

Legend for Chart:

A - OSI scales (subscales)

B - Nurses (n = 84) alpha

C - Workers (n = 1054) alpha

A

B

C

Job

satisfaction

0.92

0.93

Job & personal growth

0.82

0.88

Personal ambition &

organizational

communication

0.82

0.86

Personal identification with job &  
organization

0.78      0.73

Interpersonal relationships at work      0.65

0.68

Physical      health

0.84      0.89

Psychological      health

0.81      0.86

Stressors

0.95      0.95

Role conflicts & lack of support 0.89  
0.89

Lack of job security & home/work conflicts 0.91  
0.89

Job itself & problems of career development 0.75  
0.81

Stress of managerial role 0.67  
0.77

Coping  
0.77 0.86

Rational problem solving 0.75  
0.84

Avoidance

0.52      0.50

**TABLE II. Comparisons between nurses and industrial workers on OSI scores**

Legend for Chart:

A - OSI scales

B - Nurses (n = 84) Mean

C - Nurses (n = 84) SD

D - Workers (n = 1054) Mean

E - Workers (n = 1054) SD

F -  $t^a$

G - Female workers (n = 66) Mean

H - Female workers (n = 66) SD

I - Female workers (n = 66)  $t^b$

A B C D

E F

G H I

Job satisfaction 70.32 13.61 80.78

14.99 -6.71

81.54 14.10 -4.92

(1) 23.53 4.63 27.04

5.60 -6.50

27.22 5.64 -4.29

(2) 19.80 4.85 23.14

5.58 -5.96

23.06 4.53 -4.23

(3)		16.35	4.22	18.95
3.68	-5.53			
		19.38	3.63	-4.73
(4)		10.30	2.54	12.01
2.38	-5.90			
		11.96	2.50	-4.02
Phy. health		37.85	9.19	31.28
9.66	6.26			
		32.64	9.85	3.32
Psych. health		63.79	10.23	51.79
12.92	10.17			
		52.31	13.24	2.94

Stressors		242.26	27.92	191.54
33.34	4.91			
		189.52	28.07	11.35
(1)		81.93	16.12	65.08
12.55	9.36			
		62.31	11.92	8.57
(2)		76.64	12.03	55.57
13.85	16.08			
		48.23	10.72	15.27
(3)		47.49	5.60	44.05
7.99	5.21			
		38.49	7.14	8.41

	(4)		38.48	4.71	26.49
5.85	22.20				
		23.84	5.30	17.60	
Coping			88.98	7.12	83.82
10.13	6.14				
		102.74	12.21	8.14	
	(1)		56.54	4.95	54.90
6.88	2.83				
		53.61	6.97	2.90	
	(2)		16.08	2.26	14.22
3.05	14.00				
		13.51	3.20	5.59	

(3)		16.33	1.66	14.71
2.66	18.00			
		14.79	2.48	4.40

Note: All inter-group differences are significant at  $p < 0.001$  (two-tailed tests).

$t^a$  = nurses versus industrial workers;  $t^b$  = nurses versus female workers.

Job satisfaction: (1) = 'Job & personal growth'; (2) = 'Personal ambition & organizational communication'; (3) = 'Personal identification with job & organization'; (4) = 'Interpersonal relationships at work'.

Stressors: (1) = 'Role conflicts & lack of support'; (2) = 'Lack of job security & home/work conflicts'; (3) = 'Job itself & problems of career development'; (4) = 'Stress of managerial role'.

Coping: (1) = 'Rational problem solving'; (2) = 'Restructuring & seeking support'; (3) = 'Avoidance'.

**TABLE III. Top ten stressors for nurses and industrial workers**

Legend for Chart:

A - Stressors

B - Nurses (n = 84) Rank

C - Nurses (n = 84) %

D - Workers (n = 1054) Rank

E - Workers (n = 1054) %

A	B	C
D	E	
Inadequate guidance	1	95
8	62.6	
Very long hours	2	94
--	--	
Conflicting tasks/demands	2	94
--	--	
Taking risks	3	93.9
--	--	
Lack of consultation	4	92.8
6	66.9	
Inadequate training	4	92.8
10	60.8	
Not under control	5	92.7
--	--	

Implications of mistakes	5	92.7
--	--	--
Lack of support	6	91.6
--	--	--
Personal level of performance	6	91.6
7	62.9	
Too much work	--	--
1	74.6	
Office politics	--	--
2	74.5	
Organizational climate	--	--
3	71.4	
Lack of power	--	--
4	69.7	
New techniques, etc.	--	--
5	67.1	



Coping	-0.02	1.00	0.06	-0.09[1]
	-0.20[3]			
Job sat.	-0.05	0.05	1.00	-0.19[3]
	-0.32[3]			
Phy. health	0.26[1]		0.08	-0.19
	1.00	0.54[3]		
Psych. health	0.12	-0.10	-0.27[1]	0.50[3]
	1.00			

Note: The top diagonal is the correlation matrix for industrial workers (n = 1054), the bottom diagonal is that for the nurses (n = 84).

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By LUO LU[1], CHI SHIAU[2] & CARY L. COOPER[3]

Graduate Institute of Behavioural Sciences, Kaohsiung Medical College, Kaohsiung, Taiwan[1]; School of Nursing, Kaohsiung Medical College, Kaohsiung, Taiwan;[2] University of Manchester Institute of Science and Technology, UK[3]

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