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A Comparison of the Effect of Work Stress on Burnout and Quality of Life Between Female Nurses and Female Doctors

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ABSTRACT. The objective of this study was to compare the effect of work stress on job burnout and quality of life between female nurses and doctors in China. The participants were 947 female nurses and 685 female doctors selected from Fujian provinces by using stratified cluster sampling method. The Chinese version of Short Form-36 Health Survey was used to measure quality of life; the Occupation Stress Inventory—Revised Edition was applied for occupational stress; and the Maslach Burnout Inventory—General Survey was used to assess job burnout. Occupational stress (indicated by different stressors) played an important role in job burnout and quality of life among female nurses and female doctors when taking into account other potential influencing factors simultaneously. These results show that it is important to adopt different preventive measures to prevent burnout and improve quality of life among the 2 populations according to the different stressors.

KEYWORDS: female, job burnout, medical professionals, occupational stress, quality of life

In China, medical professionals have been a special group with large populations. By the end of 2008, the number of this population reached about 6.2 million in the country (including over 2.1 million registered doctors and assistant doctors, and nearly 1.7 million registered nurses.[1] However, medical professionals usually suffer from occupational stress resulting from high expectations coupled with insufficient time, skills, and/or social support at work.[2,3] This can lead to severe distress, job burnout, or physical illness, and finally to a decrease in quality of life (QOL).[4,5] In general, Chinese women undertake more housework than men. So the female medical professionals have the extra responsibility to deal with a lot of housework besides the tasks in hospitals. This situation leads to female medical professionals experiencing more stress. So the health-related issues, such as job burnout and quality of life, in female medical professionals themselves are being increasingly recognized and concerned. However, female nurses and female doctors have different jobs for the different training although they work together to provide health care for patients. Most Chinese nurses are trained for 3 years at a health school following 9 years of primary and secondary schooling. With a relatively low level of knowledge and skill, nurses may only help patients with many of their basic care needs. Nurses in China perform

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basic duties in both the wards and operating rooms. They are responsible for basic nursing care, which includes taking temperatures, oral administration of medicine, and giving injections. However, doctors in China are different from the nurses in the education, training, knowledge, and role. Most Chinese doctors are trained for 5 years at a medical university in what are called bachelor's degree programs. And some of them are trained for another 3 years at the medical university in master's degree programs (or 6 years in the doctoral degree program) following 5 years of bachelor's degree programs. It is usually doctors who make treatment decisions and implement an operation strategy for the patients during treatment. It is an important task to make a distinction of the major factors that may influence job burnout and QOL between female nurses and female doctors, so that the different intervention programs can be introduced to prevent job burnout and improve their QOL.

Job burnout was described as feelings of emotional exhaustion, depersonalization, and reduced personal accomplishment. Nurses and doctors are considered to be particularly susceptible to job burnout in many countries.[6–8] QOL is one of the most important aspects of human health, which is embedded in a physical, cultural, and social context. Poor QOL has been found to be strongly associated with reduced work performance and early retirement.[9] Previous studies have documented that job burnout and QOL can be influenced by multiple factors.[2,10,11] It has been suggested that in order to effectively prevent job burnout and address the QOL among female nurses and female doctors, relevant information is needed about the factors that contribute to the problems and the interventions.[12] Few studies, to date, have compared job burnout and QOL and their link to occupational stress between female nurses and doctors after taking into account other potential influencing factors simultaneously. The objectives of the present study were to make a comparison of the effect of occupational stress on job burnout and quality of life between female nurses and doctors in China after adjusting other potential influencing factors. The information will be useful to develop different strategies to prevent job burnout and improve QOL for the 2 different occupational groups in China.

METHODS

Participants

Study participants were recruited from 6 hospitals in Fujian Province in China. Stratified cluster sampling method was used to select the hospitals. Basically, 2 hospitals were randomly chosen from 3 stratums (provincial hospitals, municipal hospitals, and county-level hospitals, respectively). A survey coordinator at each hospital invited female doctors and female nurses who met the criteria that they were 18 to 60 years old and had a service of minimum 1 year. Of 1,200 female nurses who were contacted, 947 (79%) returned completed questionnaires. Of 900 female doctors who were contacted, 685 (76%) returned completed questionnaires.

Procedures

A Chinese version of Short Form-36 Health Survey (SF-36) was used to measure QOL,[13] and Occupation Stress Inventory—Revised Edition (OSI-R) was applied to evaluate the occupational stress and coping resources.[14] Questionnaires were distributed between July and August 2008.

A structured questionnaire was administered to collect information on potential influencing factors on QOL, including demographic characteristics (age, education level, marital status, and per capita family income), behavioral factors (smoking, drinking, irregularity of work and rest, irregularity of diet and physical activity), occupational factors (working years, work shift, work time [$\geq$10 h/day], performance recognized), and life satisfaction. Work shift was defined in binary (yes/no); irregularity of work and rest, irregularity of diet, performance recognized (ie, measurement of the extent to which of the performance was appreciated or recognized by her/his leaders or coworkers), and life satisfaction were categorized into 5 levels: for example, strongly satisfied, satisfied, medium, unsatisfied, and strongly unsatisfied for job satisfaction; smoking amount was categorized into 0, $\leq$5, 6–10, 11–20, and $>$20 cigarettes/day; drinking amount was categorized into none, seldom, 1–2 times/week, 3-4 times/week, and $\geq$5 times/week; regular physical activity was defined as exercise more than 30 min/day or walk over 5 km per day; physical activity was categorized into none, seldom, 1–2 times/week, 3–4 times/week, and $\geq$5 times/week.

Measures

Short Form-36 Health Survey

A Chinese version of Short Form-36 (SF-36)[13] was used to evaluate the QOL on 8 dimensions: physical functioning (PF), role limitations due to physical problems (RP), bodily pain (BP), general health (GH), vitality (VT), social functioning (SF), role limitations due to emotional problems (RE), and mental health (MH). The first 4 subscales examine physical health and are summarized in the physical component scores (PCS); the latter 4 subscales examine mental health and are summarized in the mental component scores (MCS). Item scores for each dimension are coded, summed up, and transformed to a scale from 0 (the worst possible health state) to 100 (the best possible health state).[15] The PCS and MCS were calculated using the standard scoring algorithms.[16,17] In general, the higher a score is, a better QOL it indicates.[13] The SF-36, translated into Chinese from that originally in English, has been demonstrated to have good reliability and validity in the general population in China.[13] And our previous study indicated that the Chinese version of SF-36 also had good reliability and validity when used in Chinese medical professionals.[18]

Occupation Stress Inventory—Revised Edition

The Chinese version of Occupation Stress Inventory—Revised Edition (OSI-R)[14] is a concise measure of 3 dimensions of occupational adjustment: occupational stress, psychological strain, and coping resources. For each of these domains, scales measure aspects of the environment or individual characteristics related to occupational adjustment. It has been widely used in China, and has been confirmed to have good reliability and validity in different occupational populations.[19,20]

There were 3 questionnaires in OSI-R: Occupational Role Questionnaire (ORQ), Personal Strain Questionnaire (PSQ), and Personal Resource Questionnaire (PRQ). In this study only the ORQ was applied to evaluate work stressors. There were 6 aspects in the questionnaire: (1) role overload, (2) role insufficiency, (3) role ambiguity, (4) role boundary, (5) responsibility, and (6) physical environment. Each of the 6 aspects contained 10 items with the range scores of 1 to 5. The higher scores from the Occupational Stressor Questionnaire indicated more work stressors.

Maslach Burnout Inventory—General Survey

Job burnout was assessed using the Maslach Burnout Inventory—General Survey (MBI-GS).[21] The MBI-GS consists of 16 items and 3 subscales: emotional exhaustion (5 items, eg, "working all day is really a strain for me"; 0 = never, 6 = everyday); cynicism (5 items, eg, "I doubt the significance of my work"; 0 = never, 6 = everyday); and professional efficacy (6 items, eg, "I have accomplished many worthwhile things in this job"; 0 = never, 6 = everyday). Higher scores of MBI-GS indicate higher levels of job burnout.

The MBI-GS, originally developed in English, was translated into Chinese by several professors from the nursing and medicine fields specifically for our study. To test language validity, the Chinese version was translated back into English by several other professors, and the Chinese version was reviewed. It was concluded that the Chinese version had high validity and reliability.[3,22]

Statistical analyses

Data were input with Epidata3.02, and statistical analyses were performed using SPSS15.0 for Windows. Parametric statistical methods were used for the index scores because the mean sample distribution was nearly normal and the sample size was large.

Basic descriptive analysis procedures were used to demonstrate demographic information and the OSI-R, MBI-GS, and SF-36 dimension scores. Two-sample t test was used to compare the differences of OSI-R, MBI-GS, and SF-36 subscales scores between the 2 groups. A 2-tailed test at $p < .05$ was considered to be statistically significant.

The multiple regression analysis was developed for job burnout, PCS and MCS as the dependent variables separately, the potential influencing factors (including occupational stress, behavioral factors, other occupational factors, and life satisfaction) provided interesting independent variables, meanwhile, age, education level, marital status, and per capita family income were adjusted. Predictive models were fitted for the dependent variables separately among female doctors and nurses. Model fitting was accomplished using a stepwise method with criteria for entry $p \leq .05$ and removal $p > .10$ to select potential predictors for quality of life. Categorical variables were incorporated in regression models via the use of dummy variables. The lowest level of ordered variables served as a reference category in the models.

RESULTS

Descriptive statistics for demographic information are presented in Table 1. The female doctors had a mean age of 33.2 years ($SD = 7.2$ years) with a range from 23 to 60 years and mean 11 years' working experience. The nurses had a mean age of 32.5 years ($SD = 8.1$ years) with a range from 18 to 60 years and mean 8 years' working experience. There were 44% of female nurses and 56% of female doctors who had a bachelor's degree or above. About 30% of the participants were single in the 2 groups. Female nurses had a rate of smoking of 2.2% and female doctors had a prevalence of smoking of 1.7%. And drinking rate was calculated as 5.3% in female nurses and 3.0% in female doctors. Female nurses and doctors differed in the age and educational level groups ($p < .05$; Table 1).

As shown in Table 2, there were significant differences in some dimensions scores of occupational stress, job burnout, and quality of life between female doctors and nurses. In the aspect of occupational stressors, the female nurses in this study have higher scores of role insufficiency and physical environment than female doctors, whereas female nurses have lower scores of role overload, role ambiguity, and role boundary dimensions than female doctors. And in the 3 dimensions of job burnout, the score in emotional exhaustion among the female nurses was higher than that in doctors, whereas the score in professional efficacy among female nurses was lower than that in doctors. Among the 8 dimensions of QOL, female nurses had lower scores of PF, RP, BP, GH, VT, and PCS dimensions than female doctors; other scores were similar.

Multiple regression analysis for determining the predictors for job burnout among female nurses and doctors (Table 3) showed that job burnout among female nurses was best predicted by role insufficiency, life satisfaction, role boundary, work time (≥10 h/day), physical activity, physical environment, age, and role overload, whereas job burnout among female doctors was best predicted by role overload, age, performance recognized, life satisfaction, and irregularity of work and rest. This set of predictors accounted for

Table 1.—Demographic Characteristics of the Participants (*N* = 1,632)

	Nurses (n = 947)		Doctors (*n* = 685)	
Demographic characteristics	*n*	%	*n*	%
Age group, years				
<30	463	48.9	348**	50.8
30–45	382	40.3	227	33.1
≥45	102	10.8	110	16.2
Education level				
Associate Degree or below	528	55.4	302**	44.1
Bachelors degree and above	419	44.2	383	55.9
Marital status				
Single	257	27.1	184	26.9
Married	672	71.0	487	71.1
Divorce/Widowed	18	1.9	14	2.0
Per capita family income				
<1500 (yuan)	454	47.9	301	43.9
1500–2000	259	27.3	209	30.5
>2000	234	24.7	175	25.6

*$p < .05$; **$p < .01$.

39.4% of the variance (adjusted R^2) in the job burnout among nurses and 37.0% among doctors.

Results from Table 4 showed that the physical dimension of quality of life (PCS) of nurses was best predicted by work time (≥10 h/day), physical environment, age, role insufficiency, and diet irregularity, whereas PCS of doctors was best predicted by age, role overload, physical environment, and physical activity. This set of predictors accounted

Table 2.—Mean and Standard Deviation of the Measured Variables (*N* = 1,632)

	Nurse (*n* = 947)		Doctor (*n* = 685)		
Variable	*M*	*SD*	*M*	*SD*	*t*
Occupational stressor					
Role overload (RO)	24.87	4.96	27.83	5.14	7.693**
Role insufficiency (RI)	26.10	4.92	25.25	4.66	2.303*
Role ambiguity (RA)	19.00	5.06	21.12	5.43	5.325**
Role boundary (RB)	20.05	5.39	22.50	5.12	6.006**
Responsibility (R)	24.23	5.75	24.81	6.25	1.272
Physical environment (PE)	25.84	6.66	22.58	5.87	6.615**
Job burnout					
Emotional exhaustion (EX)	10.38	6.01	9.13	5.26	4.367**
Cynicism (CY)	9.40	5.20	9.39	4.62	0.341
Professional efficacy (PE)	11.8	7.84	13.2	7.51	3.634**
Quality of Life					
Physical functioning (PF)	90.20	13.25	92.29	10.68	3.515**
Role physical (RP)	78.03	32.17	82.55	30.98	2.861**
Bodily pain (BP)	75.51	18.72	78.65	17.73	3.422**
General health (GH)	65.95	20.15	68.49	19.53	2.546*
Vitality (VT)	65.43	17.36	68.41	17.58	3.413**
Social functioning (SF)	81.85	17.93	82.88	15.76	1.207
Role emotional (RE)	71.17	37.39	70.75	37.41	0.223
Mental health (MH)	70.20	17.30	71.85	17.03	1.908
SF-36 PCS	47.84	8.20	49.73	7.41	4.772**
SF-36 MCS	47.74	10.45	48.22	10.09	0.923

*$p < .05$; **$p < .01$.

Table 3.—Predictors of Job Burnout Among Female Nurses and Doctors* (*N* = 1,632)

Variables	Estimate	SE	β	t	p value
Nurses†					
Role insufficiency	0.992	0.100	0.364	9.873	.000
Life satisfaction	−4.430	1.694	−0.264	−2.615	.010
Role boundary	0.530	0.096	0.213	5.523	.000
Work time (≥10 h/day)	2.537	1.031	0.223	2.460	.016
Physical activity	−3.425	1.563	−0.197	−2.191	.031
Physical environment	0.204	0.074	0.101	2.739	.006
Age	−0.213	0.052	−0.144	−4.118	.000
Role overload	0.300	0.108	0.111	2.786	.006
Doctors‡					
Role overload	1.145	0.147	0.437	7.783	.000
Age	−0.621	0.083	−0.421	−7.506	.000
Performance recognized	−6.226	1.253	−0.327	−4.967	.000
Life satisfaction	−3.694	0.935	−0.259	−3.948	.000
Irregularity of work and rest	2.493	0.837	0.187	2.977	.003

*Variables in the model: occupational stress (including role overload, role insufficiency, role ambiguity, role boundary, responsibility, and physical environment); demographic factors (including age, education level, marital status, and per capita family income); behavioral factors (including smoking, drinking, irregularity of work and rest, irregularity of diet, and physical activity); other occupational factors (including working years, work shift, work time [≥10 h/day], and performance recognized); and life satisfaction.
†$R^2 = 44.1\%$; adjusted $R^2 = 43.5\%$.
‡$R^2 = 38.48\%$; adjusted $R^2 = 37.8\%$.

for 45.3% of the variance (adjusted R^2) in the physical dimension of quality of life among doctors and 43.7% among nurses.

The same analysis for determining the predictors for the mental dimension of quality of life among nurses and doctors (Table 5) showed that MCS in nurses was best predicted by work time (≥10 h/day), role insufficiency, physical environment, life satisfaction, role overload, role ambiguity, and age, whereas MCS in doctors was best predicted by age, life satisfaction, responsibility, role overload, and performance recognized. This set of predictors accounted for 39.5% of the variance (adjusted R^2) in the physical dimension of quality of life among doctors and 37.4% among nurses.

Table 4.—Predictors of PCS Among Female Nurses and Doctors* (*N* = 1,632)

Variables	Estimate	SE	β	t	p value
Nurses†					
Work time (≥10 h/day)	−4.510	0.986	−0.450	−4.573	.000
Physical environment	−0.274	0.044	−0.242	−6.245	.000
Age	−0.197	0.032	−0.237	−6.132	.000
Role insufficiency	−0.293	0.059	−0.191	−4.918	.000
Diet irregularity	−2.066	1.038	−0.196	−1.991	.049
Doctors‡					
Age	−0.385	0.046	−0.435	−8.423	.000
Role overload	−0.473	0.083	−0.301	−5.705	.000
Physical environment	−0.283	0.071	−0.206	−3.988	.000
Physical activity	1.793	0.818	0.159	2.191	.030

*Variables in the model: occupational stress (including role overload, role insufficiency, role ambiguity, role boundary, responsibility, and physical environment); demographic factors (including age, education level, marital status, and per capita family income); behavioral factors (including smoking, drinking, irregularity of work and rest, irregularity of diet, and physical activity); other occupational factors (including working years, work shift, work time [≥10 h/day], and performance recognized); and life satisfaction.
†$R^2 = 45.3\%$; adjusted $R^2 = 44.8\%$.
‡$R^2 = 43.7\%$; adjusted $R^2 = 42.8\%$.

Table 5.—Predictors of MCS Among Female Nurses and Doctors* (*N* = 1,632)

Variables	Estimate	SE	β	t	p value
Nurses†					
Work time (≥10 h/day)	−4.594	1.058	−0.419	−4.341	.000
Role insufficiency	−0.627	0.085	−0.303	−7.394	.000
Physical environment	−0.280	0.058	−0.183	−4.809	.000
Life satisfaction	4.075	1.463	0.269	2.787	.007
Role overload	−0.321	0.082	−0.157	−3.932	.000
Role ambiguity	−0.276	0.081	−0.137	−3.402	.001
Age	0.140	0.041	0.124	3.437	.001
Doctors‡					
Age	0.340	0.069	0.302	4.948	.000
Life satisfaction	3.677	0.941	0.281	3.909	.000
Responsibility	−0.406	0.098	−0.246	−4.123	.000
Role overload	−0.327	0.134	−0.148	−2.445	.015
Performance recognized	2.940	1.254	0.168	2.344	.020

*Variables in the model: occupational stress (including role overload, role insufficiency, role ambiguity, role boundary, responsibility, and physical environment); demographic factors (including age, education level, marital status, and per capita family income); behavioral factors (including smoking, drinking, irregularity of work and rest, irregularity of diet, and physical activity); other occupational factors (including working years, work shift, work time [≥10 h/day], and performance recognized); and life satisfaction.
†$R^2 = 59.5\%$; adjusted $R^2 = 58.9\%$.
‡$R^2 = 57.4\%$; adjusted $R^2 = 56.3\%$.

COMMENT

Occupational stress is a result of combined exposure to several factors in work environment and employment conditions. Occupational stress has attracted increasing public concern in the past 3 decades, due to its significant impact on economic loss and health damage.[23,24] The costs of occupational stress are high due to increased absenteeism and occupational injury.[25,26] Female medical professionals have the difficulties in balancing a job and family responsibilities. They are a special group that is at a higher risk of suffering from occupational stress, as well as job burnout,[2] which leads to a reduced QOL. However, studies on this topic have been sparse, especially in Chinese female professionals. It is a critical task to make a distinction of the main factors that influence job burnout and QOL between female doctors and nurses, so that different intervention programs can be designed to prevent job burnout and improve their QOL.

China is facing a chronic shortage of nurses. With a population of nearly 1.3 billion people, China has only about 1.7 million nurses and needs 5 million more nurses to meet the global standard for a nursing labor force. Therefore, nurses suffer from occupational stress, often resulting from work overload coupled with insufficient time, training, coping skills, and/or social support at work. This can lead to severe mental or physical illness, and finally to a decrease in QOL and service provision.[27] In this study it was found that role insufficiency, physical environment, and work time (≥10 h/day) were the main common occupational stressors for job burnout, PCS, and MCS among female nurses when other potential influencing factors were taken into account simultaneously. Role insufficiency refers to the extent to which the individual's training, education, skills, and experiences are appropriate to job requirements.[28] The finding indicates that female nurses are confronted with increasing job demands due to the introduction of sophisticated technologies and increasing demands for high-quality medical services from patients or their family, so strengthening vocational skills training for nurses is an urgent task. Physical environment refers to the extent to which the individual is exposed to high levels of environmental toxins or extreme physical conditions.[28] Results from the study suggest that improving nursing working environment is an efficient preventive measure for reducing occupational stress to prevent job burnout and improve QOL among female nurses in this study. In addition, long working hours is also an important occupational stressor. Long working hours (≥10 h/day) was found to have a negative effect on the job burnout and the quality of life among female nurses in this study.

It is worthy to note that occupational stress, indicated by role overload, physical environment (contributed to PCS alone), and responsibility (related only to MCS), plays an important role in the job burnout, PCS, and MCS among female doctors. Role overload measures the extent to which job demands exceed resources and the extent to which the individual is able to accomplish workloads.[28] Responsibility measures the extent to which the individual has, or feels, a great deal of responsibility for the performance and welfare of others on the job.[28] It suggests that reducing the workload, improving working environment, and having a positive attitude toward the sense of responsibility are efficient preventive measures for reducing occupational stress,

preventing job burnout, and improving the QOL among female doctors.

This study also draws our attention to the importance of increasing life satisfaction among female medical professionals. It indicates that female medical professionals' high life satisfaction and well-balanced lives are beneficial to their quality of life and can prevent job burnout. It was also observed that some behavioral factors, such as physical activity, diet irregularity, and irregularity of work and rest, also played important roles in job burnout and QOL in the current study. Adjusting behavioral habits may be a useful measure to prevent job burnout and improve QOL among female medical professionals in China.

The strengths of this study lies in a large sample size, and adjusting all aspects of demographic characteristics, behavioral factors, other occupational factors, and life satisfaction in relation to the job burnout and QOL at the same time. However, there are some limitations that should be considered in interpretation of the results. First, the study had a cross-sectional design. Like all other cross-sectional studies, we cannot draw any causal associations between the QOL and factors of interest. Future research with a longitudinal approach may be necessary to determine the cause-effect associations. Second, all of the measures were based on self-report, which likely led to recall/report bias. However, there were no special motivations for the participants to underreport or overreport given that all of the participants were "healthy" people. The recall/report error might randomly occur in the population, which unlikely affected the direction of the associations between QOL and other factors. Third, the design suffered from the same source-same method bias, which occurs when the same method is used to measure correlations between variables. The fact that nurses and doctors completed self-reported questionnaires for measuring both the independent and dependent variables can inflate the correlation findings.

CONCLUSIONS

In summary, the results of this study suggested that occupational stress, indicated by role insufficiency, physical environment and work time ($\geq$10 h/day) was an important risk factor for job burnout and quality of life among female nurses, whereas role overload, physical environment (contributed to PCS alone) and responsibility (related only to MCS) play important roles in job burnout and QOL in female doctors. Different preventive measures should be adopted to prevent job burnout and to improve QOL between the 2 working populations according to the different occupational stressors.

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