Predictors of Married Female Nurses' Health

Li Fang, PhD; Chich-Hsiu Hung, PhD

ABSTRACT

Excessive workload from employment and household duties may negatively affect married female nurses' health. This study explored job stress, family stress, social support, and health status among married female nurses to identify predictors of nurses' health status. Using a cross-sectional design, 233 married female nurses were recruited from two regional teaching hospitals. The results showed that working hours per week, job stress, and overcommitment to their jobs were significant determinants of health status. Based on study findings, nursing supervisors should avoid scheduling nurses to work more than 48 hours per week. Job stress adjustment courses could enable nurses to relax after work, avoiding overcommitment. [*Workplace Health Saf* 2014;62(11):447-452.]

Taiwanese nurses experience stress at work for many reasons, including rapid changes in the Taiwanese health care system and an increase in demands by patients and families. Since the implementation of national health insurance in Taiwan and the launch of total health care coverage by the Bureau of National Health Insurance, demand for health care services and competition among health care institutions has increased (Huang & Kuo, 2010). Today nurses working in hospitals not only care for patients and interact with their families, but must also complete extensive paperwork related to hospital accreditation. As a result, nurses have experienced an increase in workload and occupational stress.

WORK STRESS AND HEALTH STATUS

Stress, occupational and otherwise, can increase heart rate, blood pressure, and headache incidence and lower immune functions. Stress has been found to be related to physiological symptoms of asthma and gastric ulcers by lowering the immune system, and psychiatric symptoms such as anxiety, depression, anger, sleep disorders, appetite changes, and excessive emotional reactions (Jamal & Baba, 2000; Sheu, Lin, & Hwang, 2002). Stress is associated with higher mortality rates because it affects cognitive, emotional, and physiological responses by the sympathetic, hypothalamus, adrenal, and immune systems (Donnelly, 2014; Sharrer & Ryan-Wenger, 2002).

The majority of services in health institutions involve nursing staff. The percentage of nurses among all staff in Taiwanese health institutions is 40% to 50%, the largest group of health care professionals (Taiwan Nurses Federation, 2011). According to a survey by the Taiwan Nurses Federation (2011), the number of nurses in Taiwan is 134,255. Most of these nurses are women (98.8%), and 33% of female nurses are married (Yang, Pan, & Yang, 2004). Martin-Fernandez, Ignacio de Los, Cazorla, and Martinez-Falero (2009) found that working women spend more time caring for children and completing housework than their husbands. In European countries, 25% of women aged 18 years and older care for children, but only 9% of men are responsible for child care (Martin-Fernandez et al., 2009). Furthermore, working married women experience higher levels of family stress compared to married men.

Women's status in Taiwanese society has changed considerably in past decades. Traditionally, most Taiwanese citizens worked in agriculture, and women did not work outside the home, but were responsible for household duties. The rise in women's educational levels, social change, and economic strain have led more and more women to enter the job market. As a result, female participation in the labor force was 49.9% in 2010 (Department of Health, 2011). Despite the proportion of working

ABOUT THE AUTHORS

Dr. Fang is Assistant Professor, Meiho University, Pintung, Taiwan. Dr. Hung is Professor, Kaohsiung Medical University, Kaohsiung, Taiwan.

Submitted: March 17, 2014; Accepted: July 14, 2014; Posted online: August 11, 2014

The authors have disclosed no potential conflicts, financial or otherwise.

Correspondence: Chich-Hsiu Hung, PhD, Kaohsiung Medical University, School of Nursing, 100 Shih-Chuan 1st Rd., San-Min District, Kaohsiung 80708, Taiwan. E-mail: chhung@kmu.edu.tw

doi:10.3928/21650799-20140804-06

Applying Research to Practice

Job stress, shift work, and stressful workplaces can result in health problems for hospital nurses. This study explored hospital nurses' job stress, family stress, social support, and health status to identify predictors of health status. The authors found that health problems among married female nurses were related to working overtime, high levels of job stress, and overcommitment. Programs devoted to decreasing nurses' expenditures of energy and effort should be developed. Nursing supervisors should establish policies for shift scheduling and avoid scheduling nurses for more than 48 hours per week. Job stress adjustment courses could enable nursing staff to relax and "let go" after work, avoiding overcommitment.

women increasing annually, Taiwanese women's roles in their families have shown no obvious changes (Xu et al., 2004). Working women in Taiwan experience stress not only from work, but also from household chores, child care, and care for other dependent family members. Their workload from job and family may affect the health status of working women (Xu et al., 2004).

Park, Jeong, and Park (2007) found that job and family stress were negatively correlated with health status. Xu et al. (2004) found that women who had experienced both family stress and occupational stress reported higher systolic blood pressure and more psychosomatic and sleep problems than those who did not experience both types of stress.

Nurses may gain relief from stress through the emotional support provided by family members, friends, and colleagues; social support can reduce physical and mental health problems. For example, Yang et al. (2004) found that social support positively affected nurses' health status. In addition, Tsai and Liu (2012) reported that social support was negatively correlated with symptoms of job stress. Yet another study found that nurses who received psychological support and appreciation from their managers showed fewer symptoms of job stress (Isikhan, Comez, & Danis, 2004). Uen and Tsuei (2001) found that a high level of family support mitigated emotional exhaustion caused by conflicts from both job and family stress among working women.

Married female nurses may face significantly more stress from both family and work responsibilities; therefore, their situations require the attention of occupational health nurses. The safety of health care personnel has been seriously considered in recent years; hospital accreditation criteria include workplace safety, but nurses' health problems were ignored. To remedy this situation, the authors explored the relationship between married female nurses' job stress, family stress, social support, and health status, as well as other possible predictors of health status. The results of this study can provide hospital managers with a reference in establishing a positive working environment for nurses and consequently promoting physical and mental health among married female nurses.

METHODS

Definitions

In Taiwan, clinical nursing staff can be classified by four clinical ladder levels: N1, N2, N3, and N4. Nurses at the N1 level are building a knowledge base through clinical practice and are more comfortable in a task-oriented environment. Nurses at the N2 level are fully competent in providing assigned patients' care. Nurses at the N3 level have in-depth knowledge of nursing practice based on previous experience and provide holistic care to patients. Nurses at the N4 level have intuition and skills based on comprehensive knowledge and experience; these expert nurses can provide innovative self-directed approaches to patient-centered care.

Design and Sample

Using a cross-sectional design, participants were recruited from two regional teaching hospitals located in southern Taiwan between August 3 and 12, 2012. All participants were married female nurses with a registered nursing license who had been working in their respective hospitals for more than 6 months. Nurse managers, supervisors, directors of nursing departments, and nurse specialists were excluded. Staff nurses worked one of three 8-hour shifts (day, evening, and night) in these two hospitals. The regulated number of working hours per week is 40 hours. According to the Ministry of Labor (2011), employers may extend working hours beyond those scheduled with the approval of a labor union. The extension of working hours combined with regularly scheduled working hours cannot exceed 12 hours a day.

A total of 234 questionnaires were sent to prospective participants and 233 were completed (a 99.57% return rate). According to Burns and Grove (2005), the minimum sample size for regression analysis should be 10 participants for every predictive variable; this study included 19 predictive variables, requiring a minimum sample size of 190 participants. Two hundred thirty-three participants was considered adequate.

Measures

Participants were asked to complete five structured questionnaires that included: demographic characteristics, the Effort–Reward Imbalance Scale, the Family Stress Scale, the Social Support Scale, and the 12-item Chinese Health Questionnaire.

Demographic Characteristics. The following demographic data were requested: participants' age, number of children, educational level, religion, medications for chronic diseases, significant life events in the past 3 months, work unit, level on clinical ladder, seniority (in years), shift patterns, monthly salary, monthly family expenditures, family members living together, family members requiring care, and nursing work hours per week.

Effort–Reward Imbalance Scale. The Chinese version of the Effort–Reward Imbalance Scale was used to

measure the extent of job stress experienced by participants. This scale has 23 items, each answered on a 5-point scale. The items are combined to form three dimensions: "extrinsic effort" (6 items), "reward" (11 items), and "overcommitment" (6 items). For the six items of the "extrinsic effort" dimension, participants indicated whether they agreed or disagreed with each statement. A disagree response was scored 1 point. If participants chose agree, they were requested to choose one of the following options: not disturbed, somewhat disturbed, disturbed, or very disturbed. Each of these responses was scored 2, 3, 4, and 5 points, respectively. The higher the points, the greater participants' extrinsic efforts were. The "rewards" dimension included job promotion, salary, and job instability. Items are rated on a 5-point scale, where 5 indicates agree and the values of 4, 3, 2, and 1 indicate disagree at four levels: not disturbed, somewhat disturbed, disturbed, or very disturbed, respectively. The "overcommitment" dimension included six items rated on a 4-point scale: 1 (strongly disagree), 2 (disagree), 3 (agree), and 4 (strongly agree). Participants who scored in the upper tertile of the total score for this scale were categorized as experiencing overcommitment (Siegrist et al., 2004).

The ratio of the "effort" and "reward" scales was calculated to quantify the degree of imbalance between efforts and rewards (Siegrist et al. 2004). An effort/reward ratio above 1 (effort/reward ratio > 1) indicated high effort and low reward and therefore high job stress. An effort/reward ratio lower than 1 (effort/reward ratio < 1) indicated low effort accompanied by high reward and resulted in low job stress.

Cronbach's alphas for the extrinsic effort, reward, and overcommitment dimensions were 0.78 to 0.93, 0.74, and 0.81 to 0.90, respectively (Li, Hwang, Hung, & Kao, 2010; Li, Yang, Cheng, Siegrist, & Cho, 2005). The Effort–Reward Imbalance Scale has been used in many studies, with reported Cronbach's alpha values above 0.7 (Li et al., 2005; Li et al., 2010). In this study, Cronbach's alpha values for the "extrinsic effort," "reward," and "overcommitment" scales were 0.87, 0.81, and 0.80, respectively.

Family Stress Scale. For this study, the researchers developed an 18-item Family Stress Scale based on a literature review and researchers' clinical experience. Ten nurses in two hospitals were asked to assess content validity of the tool, including the relevance of the question items and the appropriateness of the wording and grading; these nurses also proposed new items. The nurses assessed each item in the scale and scored the items as follows: 1 (meaningless, should be deleted), 2 (not appropriate, should be amended), 3 (appropriate, minor modifications needed), 4 (appropriate, no need for modification).

The resulting content validity index was 0.98, and two new items were added. Thus, the final Family Stress Scale consisted of 20 items, including statements about household burden, relationships among family members, conflicts with spouse, and responsibility for child care. Items were rated on a 5-point Likert scale: 1 (strongly disagree), 2 (disagree), 3 (no opinion), 4 (agree), and 5 (strongly agree). Scores for individual items were summed and higher total scores indicated higher levels of family stress. The Cronbach's alpha for this scale was 0.80 in this study.

Social Support Scale. The Social Support Scale, developed by Smilkstein (1978), assesses the level of care received from family members, friends, and colleagues, and involves dimensions of adaptation, partnership, growth, affection, and intimacy. The scale's validity was verified in previous studies (Hung & Chung, 2001; Hung, 2005, 2007). The Cronbach's alpha measured in this study was 0.94, showing high reliability. Items were answered on a 5-point Likert scale ranging from 1 (never) to 5 (always). Total scores for this scale ranged between 15 and 75 points, with higher scores indicating stronger social support from family members, friends, and colleagues.

12-item Chinese Health Questionnaire (CHQ-12). The CHQ-12 (Cheng & Williams, 1986) was used to explore participants' health status. This questionnaire focused on stress caused by reactions of the body, mind, and social interactions. Items were rated on a 4-point Likert scale, where a score of 0 meant not at all or about as usual, and a score of 1 meant more than usual or always. Participants with a total score of 3 or above were considered to have health problems; those with 2 points or below were considered as not experiencing health problems. Previous studies have reported high sensitivity (91.9%) and specificity (66.7%) for this scale by using two-thirds as the cut-off point for a community population (Chong & Wilkinson, 1989). Cronbach's alpha was 0.84 in this study.

Procedures

After the Institutional Review Board approved the study, the researchers explained the recruitment method and procedure to the nursing departments of the two hospitals included in the study. Then, the researchers visited every unit and provided information about the study to nurses who met the recruitment criteria. Those who agreed to participate were asked to sign an informed consent form and complete the questionnaires.

Data Analysis

Data were analyzed using SPSS for Windows (version 15; SPSS, Inc., Chicago, IL). Significant predictors of participants' health status were identified using logistic regression analysis.

RESULTS

Demographic Characteristics

The average age of the participants was 38.86 years (range: 27 to 55 years), and 131 participants (56.22%) had earned bachelor's degrees. The most frequently reported religion was Buddhism (77 participants, 33.05%), followed by no religion (76 participants, 32.62%) and Taoism (53 participants, 22.75%). Most of the participants (204, 87.55%) were not taking medication. Approximately half of the participants (116, 49.79%) had two children, followed by 62 participants having one child (26.61%). Most participants (212, 90.99%) reported

TABLE 1

Mean Scores and Frequency for Married Female Nurses' Job Stress, Family Stress, Social Support, and Health Status (*N* = 233)

Variables	*Mean ± SD*	*Frequency*
Job stress		
Extrinsic effort	20.78 ± 4.96	–
Reward	41.62 ± 8.3	–
Effort/reward ratio		
> 1	–	89 (38.20%)
≤ 1	–	144 (61.80%)
Overcommitment	16.31 ± 2.96	
Top one-third	–	72 (30.90%)
Last two-thirds	–	161 (69.10%)
Family stress	57.58 ± 10.15	–
Social support	53.85 ± 9.57	–
Health problems		
Yes	–	92 (39.48%)
No	–	141 (60.52%)

SD = standard deviation

no significant life events in the previous 3 months. The number of participants working in intensive care units and special units (emergency department or operating room) was 67 (28.75%) and 65 (27.90%), respectively. In terms of clinical ladder, 122 participants were N2 level (52.36%), followed by 49 participants at N3 level (21.03%), 38 participants at N1 level (16.31 %), and 15 participants at N4 level (6.44%.). One hundred twenty-two (52.36%) female married nurses worked all three shifts, followed by 45 (19.31%) on day shift, 41 (17.60%) on duty shift (on call for 16 hours after a regular shift to deal with emergency conditions), and 16 (6.87%) on the evening shift. Mean clinical work experience was 12.88 years. One hundred twelve nurses (48.07%) worked between 44 and 48 hours per week, followed by 72 nurses (30.90%) who reported working less than 44 hours per week and 49 (21.03%) nurses who worked 48 hours or more per week.

Ninety-four participants (40.34%) earned a monthly salary between $40,001 and $50,000 (New Taiwanese), followed by 76 participants (32.62%) with a monthly salary between $30,001 and $40,000 (New Taiwanese). Only four participants (1.72%) reported a monthly salary of $25,000 (New Taiwanese) or less. Participants who reported contributing 50% or less of the household expenditures accounted for 45.49% of the sample (106 participants); 67 participants (28.76%) paid between 51% and 75% of household expenses. Regarding the number of family members living together, 26.61% of the participants reported that three family members lived together in their homes. The majority of the participants (63.09%) reported no family members needing care, and the proportion of participants taking care of one, two, three, or four dependent family members was 18.02%, 11.59%, 6.01%, and 1.29%, respectively (**Table A**, available in the online version of this article).

Married Female Nurses' Job Stress, Family Stress, Social Support, and Health Status

Mean scores for extrinsic effort, reward, and overcommitment were 20.78, 41.62, and 16.31, respectively (**Table 1**). More than one-third of the participants (38.20%) scored an effort/reward ratio above 1, indicating high effort and low reward and, as a result, high job stress. Of these respondents, 72 (30.90%) demonstrated overcommitment to their jobs. The mean score was 57.58 (standard deviation = 10.15) on the Family Stress Scale and 53.85 (standard deviation = 9.57) on the Social Support Scale. Health problems were found in 39.48% of the participants (**Table 1**).

Relationships Between Participants' Health Status and Their Demographic Characteristics, Job Stress, Family Stress, and Social Support

Differences among participants on most variables did not correspond to significant differences in health status. The variables that distinguished participants with health problems from those without health problems were working hours per week ($p < .01$), effort/reward ratio ($p < .01$), overcommitment ($p < .01$), family stress ($p < .01$), and social support ($p < .01$) (**Table B**, available in the online version of this article).

Significant Predictors of Married Female Nurses' Health Status

Multiple logistic regression was used to identify the main predictors of participants' health status (**Table 2**). Married female nurses working 48 hours or more per week were 4.17 times more likely to suffer from health problems than those who worked less than 44 hours per week. Married female nurses with an effort/reward ratio higher than 1 (high job stress) were 5.93 times more likely to have health problems compared to those nurses whose effort/reward ratio was 1 or less (low job stress). Participants who showed overcommitment to their jobs were 2.59 times more likely to suffer from health problems compared to those who were not overcommitted.

DISCUSSION

In this study, the researchers found that married female nurses with working hours of 48 hours or more per week were 4.17 times more likely to suffer from health problems than those who worked less than 44 hours per week. This result is similar to the findings of Smith, Wei, Zhang, and Wang (2006). Nursing requires significant labor, including lifting patients and repeated manual tasks (Smith, Wei, & Kang, 2004). In addition to extensive effort, nurses' jobs also require them to be highly responsible. If nurses work overtime, their bodies and minds cannot benefit from adequate rest, which can lead to musculoskeletal problems and depression.

TABLE 2

Important Predictors of the Married Female Nurses' Health Status

Variables	*B*	*SE*	*Wald*	*p*[a]	*Exp (B)*
Nursing working hours per week					
44 to < 48 to < 44	0.31	0.39	0.65	.42	1.37
≧ 48 to < 44	1.43	0.48	8.94	**< .01**	4.17
Job stress					
Effort/reward ratio （> 1 / ≤ 1)	1.78	0.35	26.53	**< .01**	5.93
Overcommitment (top one-third/last two-thirds)	0.95	0.35	7.31	**.01**	2.59
Family stress	0.01	0.02	0.47	.49	1.01
Social support	-0.03	0.02	2.52	.11	0.97
Constant	-1.11	1.64	0.46	.50	0.33

[a]*Bold values are significant.*

In addition, married female nurses with high levels of job stress and overcommitment reported more health problems. This result was similar to that of Yang et al. (2004), who found that hospital nurses with high job stress had double the risk of suffering health problems compared to nurses with low job stress. Similarly, Ho et al. (2010) found that higher job stress corresponded to poorer health status among nurses. Taken together, these results demonstrate that job stress may lead to physical and mental health problems among nurses.

In this study, participants reported middle to high degrees of social support regardless of whether they had health problems or not. These results were similar to the study by Chuang, Lin, Chen, and Tsai (2008), who found that 60% of new nurses reported a high degree of social support from their nurse manager and family. Although the participants in this study were married female nurses, a different population from the one studied in Chuang et al. (2008), both new nurses and married female nurses reported middle to high degrees of social support. However, social support was not a significant predictor of married female nurses' health status. Therefore, lack of social support may not be a problem for married female hospital nurses and does not affect their health status. This finding is inconsistent with the results of Yang et al. (2004), who reported that the presence or lack of social support affects nurses' health status.

The high level of social support among nurses participating in this study probably explains why these nurses do not report experiencing high levels of family stress. Although most participants had children, the nurses' health status was not predicted by the level of family stress they experience. Therefore, it is not so much the conflicting demands of work and family but rather the demanding and stressful nature of work that affects nurses' health negatively. This finding can be considered a positive result in terms of intervention development because focusing on work-related factors only is easier than facilitating changes at both work and home.

The results of this study show that the presence of health problems among married female nurses is related to working overtime (more than 48 hours a week). Furthermore, high levels of job stress and overcommitment also predicted the presence of health problems. These results show that the demanding nature of nurses' work affects their health, and therefore steps should be taken to decrease job stress in this group. On the other hand, the majority of nurses reported that social support and family stress were not significant predictors of health status, suggesting that it is the characteristics of their work that negatively affect their health, rather than conflicting demands of family and work.

Limitations

A limitation of the current study is that participants were recruited from two regional hospitals only. Thus, this sample is not representative of the population of married female nurses overall. Future studies are also needed to test whether these results generalize to nurses working in other types of hospitals.

Another limitation was the use of self-reported measures and a cross-sectional design. Future studies may be able to improve study reliability and validity by applying biological measures, such as blood pressure readings or diagnosis of coronary heart disease as health indicators and cortisol level in saliva as an indicator of job stress. A longitudinal study design could contribute to the analysis of cause-effect relationships between married nurses' job stress, family stress, and health status.

IMPLICATIONS FOR OCCUPATIONAL HEALTH NURSES

The results of this study show that the presence of health problems among married female nurses is related to working overtime (more than 48 hours per week), high levels of job stress, and overcommitment. Therefore, nursing supervisors are advised to establish policies for scheduling shifts to prevent nursing staff from working more than 48 hours a week, thereby preventing health problems among nurses.

Furthermore, hospital administrators should adopt strategies to reduce nurses' job stress. For example, Praissman (2008) suggested that relaxation techniques could reduce stress levels among nurses. Lifestyle modifications may also be useful in reducing job stress and promoting health. Programs devoted to decreasing nurses' expenditures of energy and effort should also be developed. One way of facilitating such changes would be to offer stress management courses during which nursing staff would be trained in relaxation techniques and learning how to "let go" after work to avoid overcommitment.

REFERENCES

Burns, N., & Grove, S. K. (2005). *The practice of nursing research: Construct, critique, utilization* (5th Ed.). Philadelphia: Elsevier.

Cheng, T. A., & Williams, P. (1986). The design and development of a screening questionnaire (CHQ) for use in community studies of mental disorders in Taiwan. *Psychological Medicine*, *16*, 415-422.

Chong, M. Y., & Wilkinson, G. (1989). Validation of 30- and 12-item versions of the Chinese Health Questionnaire (CHQ) in patients admitted for general health screening. *Psychological Medicine*, *19*, 495-505.

Chuang, Y. H., Lin, S. H., Chen, H. Y., & Tsai, P. L. (2008). Work stress and social support among new nurses in a regional teaching hospital in Kaohsiung. *The Kaohsiung Journal of Nursing*, *25*, 15-19.

Department of Health. (2011). *Gender indicators.* Taipei: Department of Health, Executive Yuan, R.O.C.

Donnelly, T. (2014). Stress among nurses working in an acute hospital in Ireland. *British Journal of Nursing, 23*, 746-750.

Ho, H. C., Chang, S. H., Tsao, J. Y., Chang, M. F., Chen, Y. H., & Yang, T. (2010). The relationship between job stress and physical-mental health among hospital staff. *Chinese Journal of Occupational Medicine*, *17*, 239-252.

Huang, M. H., & Kuo, C. L. (2010). Correlation study of career barriers and coping strategies among female nurses. *Journal Nursing and Healthcare Research, 5*, 91-99.

Hung, C. H. (2005). Measuring postpartum stress. *Journal of Advanced Nursing*, *50*, 417-424.

Hung, C. H. (2007). Psychosocial features at different periods after childbirth. *The Kaohsiung Journal of Medical Science*, *23*, 71-79.

Hung, C. H., & Chung, H. H. (2001). The effects of postpartum stress and social support on postpartum women's health status. *Journal of Advanced Nursing*, *36*, 676-684.

Isikhan, V., Comez, T., & Danis, M. Z. (2004). Job stress and coping strategies in health care professionals working with cancer patients. *European Oncology Nursing Society*, *8*, 234-224.

Jamal, M., & Baba, V. V. (2000). Job stress and burnout among Canadian managers and nurses: an empirical examination. *Canadian Journal of Public Health*, *91*, 454-458.

Li, J., Yang, W., Cheng, Y., Siegrist, J., & Cho, S. (2005). Effort-reward imbalance at work and job dissatisfaction in Chinese healthcare workers: A validation study. *International Archives of Occupational and Environmental Health*, *78*, 198-204.

Li, P. H., Hwang, S. H., Hung, C. L., & Kao, K. (2010). Gender differences and perceived job stress among nursing personnel. *Hospital*, *43*, 23-34.

Martin-Fernandez, S., Ignacio de Los, R., Cazorla, A., & Martinez-Falero, F. (2009). Pilot study on the influence of stress caused by the need to combine work\and family on occupational accidents in working women. *Safety Science*, *47*, 192-198.

Ministry of Labor. (2011). *Labor law and regulation.* Retrieved from http://laws.mol.gov.tw/Eng/Default.asp

Park, H. S., Jeong, S. H., & Park, K. Y. (2007). Prediction of perceived health status on job stress and family stress with middle school teachers [article in Korean]. *Taehan Kanho Hakhoe Chi*, *37*, 549-557.

Praissman, S. (2008). Mindfulness-based stress reduction: A literature review and clinician's guide. *Journal of American Academic Nurse Practice*, *20*, 212-216.

Sharrer, V. W., & Ryan-Wenger, N. A. (2002). School-age children's self-reported stress symptoms. *Pediatric Nursing*, *28*, 21.

Sheu, S., Lin, H. S., & Hwang, S. L. (2002). Perceived stress and physio-psycho-social status of nursing students during their initial period of clinical practice: The effect of coping behavior. *International Journal of Nursing Studies*, *39*, 165-175.

Siegrist, J. (1996). Adverse health effects of high/effort/low-reward conditions. *Journal of Occupational Health Psychology*, *1*, 27-41.

Siegrist, J., Starke, D., Chandola, T, Godin, I., Marmot, M., Niedhammer, I., & Peter, R. (2004). The measurement of effort—reward imbalance at work: European comparisons. *Social Science & Medicine, 58*, 1483-1499.

Smith, D. R., Wei, N., & Kang, L. (2004). Musculoskeletal disorders among professional nurses in mainland China. *Journal of Professional Nursing*, *20*, 390-395.

Smith, D. R., Wei, N., Zhang, Y. J., & Wang, R. S. (2006). Musculoskeletal complaints and psychosocial risk factors among physicians in mainland China. *Occupational Medicine*, *54,* 579-582.

Taiwan Nurses Federation. (2011). *Nursing personnel statistics.* Taipei: Republic of China Nurses Federation. Retrieved from http://dx.doi.org/10.1016/j.ergon.2006.01.014

Tsai, Y. C., & Liu, C. H. (2012). Factors and symptoms associated with work stress and health-promoting lifestyles among hospital staff: A pilot study in Taiwan. *BMC Health Service Research, 12*, 1-8.

Uen, J. F., & Tsuei, L. I. (2001). A study of work-family conflicts and job burnout of female professionals in high-tech companies: Effects of social support. *Management Review*, *20*, 65-91.

Xu, L., Siegrist, J., Caoc, W., Li, L., Tomlinson, B., & Chan, J. (2004). Measuring job stress and family stress in Chinese working women: A validation study focusing on blood pressure and psychosomatic symptoms. *Women Health*, *39*, 31-26.

Yang, M. S., Pan, S. M., & Yang, M. J. (2004). Job strain and minor psychiatric morbidity among hospital nurses in southern Taiwan. *Psychiatry and Clinical Neurosciences*, *58*, 636-641.

TABLE A

Demographic Characteristics of Married Female Nurses (*N* = 233)

Variables	*Number (%)*
Age (yrs), mean ± SD	38.86 ± 6.29
Educational level	
Vocational	1 (0.43)
Junior college	93 (39.91)
Bachelor	131 (56.22)
Master	8 (3.43)
Religion	
None	76 (32.62)
Christianity	20 (8.58)
Catholicism	5 (2.15)
Buddhism	77 (33.05)
Taoism	53 (22.75)
Yit Kuan Tao	2 (0.86)
Taking medications for chronic disease	
None	204 (87.55)
Cardiovascular	7 (3.00)
Gastrointestinal	6 (2.58)
Urinary	1 (0.43)
Neurologic	2 (0.86)
Others	13 (5.58)
Number of children	
0	40 (17.17)
1	62 (26.61)
2	116 (49.79)
3	12 (5.15)
4	3 (1.29)
Significant life events in the past 3 months	
No	212 (90.99)
Yes	21 (9.01)
Working units	
Medical	33 (14.16)
Surgical	51 (21.89)
Intensive care	67 (28.75)
Gynecology/obstetrics and pediatrics	17 (7.30)
Emergency room or operation room	65 (27.90)
Level on clinical ladder	
N0	15 (6.44)
N1	38 (16.31)
N2	122 (52.36)
N3	49 (21.03)
N4	9 (3.86)

TABLE A (cont'd)

Demographic Characteristics of Married Female Nurses (*N* = 233)

Variables	*Number (%)*
Shift patterns	
Fixed day shift	45 (19.31)
Fixed evening shift	16 (6.87)
Fixed night shift	9 (3.86)
Three shifts	122 (52.36)
Duty shift	41 (17.6)
Nursing working years, mean ± SD	12.88 ± 6.50
Nursing working hours per week	
< 44	72 (30.90)
≥ 44 to < 48	112 (48.07)
≥ 48	49 (21.03)
Monthly salary (dollars)	
≤ 25,000	4 (1.72)
25,001 to 30,000	15 (6.44)
30,001 to 40,000	76 (32.62)
40,001 to 50,000	94 (40.34)
50,001 to 60,000	36 (15.45)
> 60,000	8 (3.43)
Burden for family monthly expenditure	
100% to > 76%	33 (14.16)
≤ 75% to > 51%	67 (28.76)
≤ 50% to > 26%	106 (45.49)
≤ 25%	27 (11.59)
Number of family members living together	
1	22 (9.44)
2	38 (16.31)
3	62 (26.61)
4	59 (25.32)
5	32 (13.73)
6	7 (3.00)
7	12 (5.15)
10	1 (0.43)
Number of family members needing to be taken care of	
0	147 (63.09)
1	42 (18.02)
2	27 (11.59)
3	14 (6.01)
4	3 (1.29)

SD = standard deviation

TABLE B

Relationships Between Participants' Health Status and Their Demographic Characteristics, Job Stress, Family Stress, and Social Support (*N* = 233)

Variables	*No Health Problems (n = 141)*	*With Health Problems (n = 92)*	*t or Chi-square*	*p*
Age (yrs), mean ± SD	38.77 ± 5.98	39 ± 6.78	-0.27	.79
Educational level				.103[a]
Vocational and junior college	63 (67.02%)	31 (32.98)		
Bachelor and above	78 (56.12%)	61 (43.88%)		
Religion			0.17	.982[b]
None	47 (61.84%)	29 (38.16%)		
Buddhism	47 (61.04%)	30 (38.96%)		
Taoist	31 (58.49%)	22 (41.51%)		
Others	16 (59.26%)	11 (40.74%)		
Taking medications for chronic disease				.548[a]
No	125 (61.27%)	79 (38.73%)		
Yes	16 (55.17%)	13 (44.83%)		
Number of children		2.18	.54	
0	21 (52.5%)	19 (47.5%)		
1	41 (66.13%)	21 (33.87%)		
2	69 (59.48%)	47 (40.52%)		
3 or 4	10 (66.67%)	5 (33.33%)		
Significant life events in the past 3 months			.49[a]	
No	130 (61.32%)	82 (38.68%)		
Yes	11 (52.38%)	10 (47.62%)		
Working units			4.465	.347[b]
Medical unit	21 (63.64%)	12 (36.36%)		
Surgical unit	28 (54.9%)	23 (45.1%)		
Intensive care unit	42 (62.69%)	25 (37.31%)		
Gynecology/obstetrics and pediatrics	7 (41.18%)	10 (58.82%)		
Emergency room or operation room	43 (66.15%)	22 (33.85%)		
Level on clinical ladder			0.15	.93[b]
N0 and N1	31 (58.49%)	22 (41.51%)		
N2	74 (60.66%)	48 (39.34%)		
N3 and N4	36 (62.07%)	22 (37.93%)		
Shift pattern			0.1	.95[b]
Fixed shift	36 (59.02%)	25 (40.98%)		
Three shift	75 (61.48%)	47 (38.52%)		
Duty shift	25 (60.98%)	16 (39.02%)		
Nursing working years, mean ± SD	12.95 ± 6.35	12.78 ± 6.77	0.19	.85
Nursing working hours per week			14.01	< .01[b]
< 44	52 (72.22%)	20 (27.78%)		
≥ 44 to < 48 hours	70 (62.5%)	42 (37.5%)		
≥ 48 hours	19 (38.78%)	30 (61.22%)		

TABLE B (cont'd)

Relationships Between Participants' Health Status and Their Demographic Characteristics, Job Stress, Family Stress, and Social Support (*N* = 233)

Variables	*No Health Problems (n = 141)*	*With Health Problems (n = 92)*	*t or Chi-square*	*p*
Monthly salary (dollars)			4.66	.20[b]
≤ 30,000	9 (47.37%)	10 (52.63%)		
30,001 to 40,000	49 (64.47%)	27 (35.53%)		
40,001 to 50,000	61 (64.89%)	33 (35.11%)		
≥ 50,001	22 (50%)	22 (50%)		
Burden for family monthly expenditure payments			6.91	.08[b]
100% to ≤ 76%	15 (45.45%)	18 (54.55%)		
≤ 75% to < 51%	38 (56.72%)	29 (43.28%)		
≤ 50% to < 26%	73 (68.87%)	33 (31.13%)		
≤ 25% to 0%	15 (55.56%)	12 (44.44%)		
Number of family members living together			6.32	.28[b]
1	9 (40.91%)	13 (59.09%)		
2	22 (57.89%)	16 (42.11%)		
3	43 (69.35%)	19 (30.65%)		
4	35 (59.32%)	24 (40.68%)		
5	21 (65.63%)	11 (34.38%)		
≥ 6	11 (55%)	9 (45%)		
Number of family members needing to be taken care of				.890[a]
0	88 (59.86%)	59 (40.14%)		
≥ 1	53 (61.63%)	33 (38.37%)		
Job stress				
Effort/reward ratio				< .01[a]
> 1	28 (31.46%)	61 (68.54%)		
≤ 1	113 (78.47%)	31 (21.53%)		
Over-commitment				< .01[a]
Top one-third	25 ± 34.72	47 ± 65.28		
Last two-thirds	116 ± 72.05	45 ± 27.95		
Family stress, mean ± SD	12.95 ± 6.35	12.78 ± 6.77	3.73	< .01[c]
Social support, mean ± SD	55.28 ± 9.68	51.65 ± 9.01	-2.87	< .01[c]

SD = standard deviation
[a]*Fisher's exact test.*
[b]*Chi-square test.*
[c]*t test.*