ORIGINAL ARTICLES

Job demand and control among clinical nurses in a provincial hospital and related factors: Results from a cross-sectional study in 2020

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ABSTRACT

Objective: This study aimed to examine the psychological work environments and associated factors among clinical nurses in a provincial tertiary hospital in the North of Vietnam in 2020.

Methods: A cross-sectional survey was conducted among all nurses of 22 clinical wards who directly provided care to patients. 261/318 eligible nurses returned the self-reported survey questionnaires that consisted of the Vietnamese version of the Job Content Questionnaire 22 items and originally developed questions on personal characteristics and work conditions. Descriptive analysis, t-test, ANOVA, and multivariate linear regressions were applied to describe the current job demand, job control, and related factors at the significant level p less than 0.05.

Results: The response rate of the current study was 82.1%. Nurses reported moderate job demand (29.39±3.64) and job control (66.86±5.79). Increased job control was significantly associated with more frequency of receiving support from superiors ($p<0.001$), a self-perceived opportunity of promotion ($p = 0.011$), and more night shifts per week ($p=0.004$). Less support from co-workers and more night shifts were associated with a higher job demand score among study participants ($p = 0.041$ and 0.002, respectively).

Conclusions: Several nurses in the provincial hospital work in unfavorable work environments with high job demand and low job control, which could adversely affect nurses' well-being. It is essential to promote social support at work to improve the psychological working conditions and performance of study participants.

Keywords: *Job demand, Job control, JCQ, clinical nurses, provincial hospital, Vietnam.*

INTRODUCTION

Work-related psychological stress is a prevalent problem among workers in many occupations, including healthcare workers. Studies showed that the highest prevalence of psychological stress was observed among nurses (1). Particularly in Southeast Asian countries, work-related stress among nurses has remarkably elevated (2-5) due to the increased medical needs resulting from the population's rapid aging and the severe deficit in the nursing workforce (6, 7). Nurses, an indispensable component of any health system, play an essential role in the well-being of society. However, nursing work is characterized by high job demands (i.e., direct contact with patients, exhausting workdays, night shifts) (8), and limited job control over the tasks they perform as a result

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of the numerous regulations and operating protocols that regulate and limit the activity of these professionals (9). According to one of the most influenced models of job stress, the Karasek's demand-control model, an adverse psychosocial work environment, which were characterized by high demand, low control, and low support/ resource (10), could be the prognostic factor for the poorer mental health of nurses, lower well-being (11), higher physical symptoms (12), and higher stress-related symptoms (13), compared with workers in other occupations (14).

According to Schaufeli et al. (2004), job demands are defined as the physical, psychological, social, or organizational aspects of the job that require sustained physical and/ or psychological effort. Job demands may turn into job stressors for workers when meeting those demands requires high effort and is, therefore, associated with negative responses such as depression, anxiety, or burnout (15, 16), reduced individual job satisfaction, long-term absenteeism (17), and intention to leave (16). On the other hand, job control is an essential work characteristic (18) defined as one's control over one's task and performance (10) or the ability to influence one's work and work environment to obtain an expected work results. Perceived job control reflects the belief or perception that a person can influence or change work (19). Studies reported that nurses with high job demand and low job control were more likely to suffer from diseases such as depression, acute fatigue (16, 20-22), burnout (20, 22), work-life imbalance (21-23), lower job satisfaction (21, 22), poor performance (24), and high intentions of leaving (10, 16, 23). Therefore, it is important to understand the psychological aspects of the nursing work environment to reduce job demand and increase job control for nurses.

In Vietnam, provincial tertiary hospitals are characterized by stressful working environments, high workload, a shortage of skilled health staff, and inadequate infrastructure and medical equipment (25). These conditions were associated with the development of mental problems among nurses. In a recent study, more than 45% of tertiary hospital nurses reported at least one mental symptom (i.e., depression, anxiety, or stress) (3). However, nurses' work environment in current studies was mostly evaluated via the physical indicators, such as a number of extra work hours or on-duty night shifts, without considering their actual psychological impact on nurses' mental health (3, 4). Only one study reported the condition of job demand/control in a large Vietnamese hospital at the national level (26). This situation among provincial hospitals remains unknown. Hence, this study was conducted to measure the psychological work environment, i.e., job demand and job control, of clinical nurses in a Vietnamese provincial hospital and identify factors associated with these work characteristics. The results from this study provide insights for appropriate actions to support nurses with an unfavorable work environment and improve their well-being and work performance.

METHODS

Study design

An institution-based cross-sectional study was implemented in one provincial tertiary hospital in a Northern mountainous province of Vietnam from February to April 2020.

This provincial tertiary hospital had the occupancy rate of hospitals bed as 112% in 2019. There were approximately 700 outpatient appointments and 800 inpatients

per day. The total number of the hospital staff was 679 employees; nearly half of them were nurses (318 nurses) (27).

Time and location

Data collection was conducted in one general hospital in a mountainous province of Vietnam, located in the Northwest region, from February to April 2020.

Study participants

The study sample consisted of nurses (including head nurses) working in the hospital's 22 clinical wards for over six months and agreed to participate in this study. Nurses who were mainly in charge of administrative works or worked in the laboratory were not invited. The study also excluded nurses who were not present at the hospital during the study period or under mental health treatment.

Sample size and selection of participants

The study invited all eligible nurses in the hospital. After reviewing the inclusion and exclusion criteria, 261/318 nurses participated in the study and answered the self-reported questionnaires (response rate: 82.1%).

Study variables

Outcome variables were Job demand and Job control measured by the corresponding subscales of the 22-item Job Content Questionnaire (JCQ-22). JCQ is a well-established self-reported instrument to measure the work dimensions based on the Demand-Control model in the workplace(10). The Vietnamese version of JCQ-22 (JCQ-22V) was a validated tool to measure nurses' psychological work environment(26). A five-item psychological demand scale measures job demand, and job control is calculated by a nine-item decision latitude scale. Response categories for these items are on a four-point scale: "Strongly disagree", "Disagree", "Agree" and "Strongly agree"(range, 1–4). A sum of weighted item scores was used as a scaled score according to the following calculation formulas(26):

Skill Discretion = (Q3 + Q5 +Q7 + Q9 + Q11 + (5-Q4))*2

Decision Authority = (Q6 + Q10 + (5 – Q8))*4

Decision Latitude= (Skill Discretion) + (Decision Authority)

Psychological Demand = (Q19 + Q20)*3 + (15- (Q22 + Q23 +Q26))*2

Related factors included two groups: Individual and work characteristics. Individual information consisted of age, sex (male and female), average monthly income in 2019, education attainment (college/ lower and university/ higher), years of service, drinking (yes/no), smoking (yes/no), labor contract (fixed term contract and permanent/ unlimited contract, unlimited contract meant that the contract had a commencement date but no end date). Work characteristics contained a number of night-shifts per week, feeling satisfied with co-workers (never, sometime, frequent and always), receiving support from co-worker or supervisor (never, sometime, frequent and always), experienced verbal abuse from patients and their families (never, sometime, frequent and always), a self-perceived opportunity of promotion (yes/ no).

Data collection tool, technique, and procedure

The self-reported questionnaires consisted of the JCQ-22V, and questions on individual and work characteristics were prepared and piloted among ten nurses to finalize the study's data collection tool. Permission from the

hospital management board and participants' consent forms were obtained before the data collection. Researchers went to each ward to introduce the study, invite participants, and distribute the questionnaires to participated nurses. Participants gathered in the ward's meeting room to answer the self-reported questionnaires with the researchers' assistance if any information was unclear to them.

Data analysis

Data were coded and entered into a computer using the software Epidata version 3.1. Data cleaning and analysis were performed using SPSS version 20.0. Descriptive analysis (i.e., frequency, mean, standard deviation SD) was used to describe the participants' characteristics and levels of job demand and job control. T-test, ANOVA, correlation, and multivariate linear regression were used to examine associations between job demand, job control, and related factors at the significant level $p < 0.05$.

Ethical consideration

The study was approved by the Ethical Committee of Hanoi University of Public Health in accordance with the Decision No 30/2020/YTCC-HD3 dated 13/2/2020. Participation was voluntary. Nurses could withdraw from the study at any time or refuse to answer any questions that they were uncomfortable with, and their actions would not cause any disadvantages to them. All study materials and information were confidential and only accessible to the researchers. Anonymous reporting of results was applied.

RESULTS

Among 261 participated nurses, most of them were female (80.5%) and had permanent or unlimited contracts with the hospital (96.2%). Their average age and number of years working as nurses were 32.91 and 9.65, respectively. Nurses were on night duty twice per week on average and reported a monthly income of about 6.5 million VND in 2019. One-third of participants attained university and a higher degree in nursing. A small percentage of study participants reported an unhealthy lifestyle such as drinking and smoking (18.4% and 7.7%, respectively) (Table 1).

Table 1. Characteristics of study participants (N=261)

Characteristics of study participants		N/ mean	%/ SD
Age		32.91	4.77
Years of service		9.65	5.00
Monthly income in 2019		6.41	2.82
Night shift per week		1.96	0.72
Sex	Male	51	19.5
	Female	210	80.5
Education	College and lower	175	67.0
	University and higher	86	33.0

Labor contract	Fixed-term contract	10	3.8
	Permanent or unlimited contract	251	96.2
Smoking	No	241	92.3
	Yes	20	7.7
Drinking	No	213	81.6
	Yes	48	18.4

The results of job demand and control were presented in Table 2. The average score and standard deviation of job demand were 29.39±3.64. The mean score for job control was 66.86 (±5.79). Mean scores of decision authority and skill discretion, job control's two subscales were 32.98 and 33.88, respectively.

Table 2. Self-assessment of Job Demand and Job Control at work (N= 261)

Scales (Number of items) [possible range]	Mean	SD	Min	Max
Job demand (5) [12-48]	29.39	3.64	18	46
Job control (9) [24-96]	66.86	5.79	42	90
Skill discretion (6) [12-48]	*33.88*	*2.71*	*24*	*44*
Decision authority (3) [12-48]	*32.98*	*4.17*	*12*	*48*

The associations between job demand, job control and individual characteristics and work conditions were shown in Table 3. Regarding job control, results from t-test/ one-way ANOVA showed that changes in job control score were associated with frequency of receiving support from supervisors and co-workers ($p<0.001$), a self-perceived opportunity of promotion ($p = 0.002$), frequency of experiencing verbal abuse from patients and their families ($p=0.002$). Specifically, nurses who frequently received help from their colleagues or reported fewer times of verbal violence from the clients tent to report a higher score of job control. Job control was weakly and negatively correlated with the monthly income ($p=0.049$), or in other words, low income might be associated with the reduction of job control among study participants. In the multivariate linear regression, higher scores of job control were significantly associated with the higher frequency of supervisor's support ($p<0.001$), having an opportunity of promotion ($p = 0.011$), and more night shifts per week ($p=0.004$).

Regarding job demand, crude analysis on job demand and related factors also showed that job demand positively correlated with the number of night-shifts per week ($p=0.001$). Nurses with more night-shifts reported a higher score of job demand. In the Linear regression, less support from co-workers and

more night shifts were associated with higher job demand scores among study participants ($p = 0.041$ and 0.002, respectively).

DISCUSSION

Our study's findings showed moderate levels of job demands and job controls among clinical nurses in a provincial tertiary hospital located in the North of Vietnam. The associations between several work-related factors and job demand/job control emphasized the need for workplace stress support and intervention for nurses with higher job demand and lower job control.

Level of job demand and job control

Nurses in our study reported an average level of job demand (29.39±3.64), which were lower than mean scores of job demand in previous studies among nurses using the same construct in Iran (37.4±5.8) (28), Thailand (33.5±4.4) (5), Germany (31.27±5.42) (11), and Vietnam (31.6±4.4) (26) but higher than that among Malay nurses (29). On the other hand, the level of job control experienced by nurses in our study (66.86±5.79) was higher than that among Iranian nurses (65.3±7.6) (28), Malay nurses (29), but lower than that of Thai nurses (70.7±6.9) (5), and Vietnamese nurses in a national hospital reported by Sasaki et al. in 2019 (71.0±6.4) (26).

Hospitals with different work mechanisms and settings in other locations would have a non-identical amount of workloads and authority levels for their employees, resulting in the inconsistency in job demand and control across studies. The only one study in Vietnam using JCQ to report job demand and control was conducted in a national hospital, which was third to fourth times larger in scale than the provincial hospital in our study (26), explaining the higher work demand and control there. To the best of our knowledge, this study is the first to measure a general hospital's psychological work environments at the provincial level in Vietnam.

In addition, since the psychological work environment was individuals' self-perception to their external work conditions (10), individuals' characteristics such as gender, age, number of nursing years, etc., might influence their assessment of job demand and control. For example, newly qualified nurses may experience anxiety or stress in their first few years working in the hospital. Younger nurses may also lack the clinical experience to deal with complicated cases independently and may be more susceptible to experience work-related pressure and stress, workplace violence, bullying, or emotional abuse at work (30). Such conditions might make nurses perceive higher work burdens and lack of control over their job. Nurses with higher education attainment might be assigned with superior job positions or complex tasks, which require higher capability, thus increasing their workload. There were similarities and differences regarding these characteristics of nurses among published studies. Our study sample was similar to that of the Malay study regarding age (29), but the Malay sample included only female nurses with fewer years of work experience. Nurses in the current study had an older average age and fewer years of services than Thai nurses with much lower monthly income (5). Regarding educational level, the percentage of study participants with university and a higher degree in our study was lower than Vietnamese national hospital nurses (26) and Iranian nurses (28).

Factors related to job demand and job control

One reason for the lack of studies reporting the psychological work environment in Vietnam is the small number of standardized scales to measure this construct, and they are not free to use. For example, the use of JCQ requires a considerably high fee, which is difficult to afford for researchers from such low and middle-income countries as Vietnam. This situation further emphasizes the necessity to identify factors related to high job demand and low job control for appropriate solutions to improve nurses' working conditions and their associated health issues. Results from our multivariate analysis showed that support at work from superiors and co-workers, a number of night shifts per week, and opportunities for promotion were associated with job demand and job control.

Our findings on the relationship between job demand, job control, and support at work were consistent with the theory of Job demand-control-resource model (10) and previous works. Nurses frequently receiving support from supervisors perceived a higher level of job control in our study. This result was in line with the findings of studies among nurses in Italy (19, 31) and Thailand (5). Meanwhile, participating nurses receiving more support from co-workers reported a lower level of job demand. This result confirmed that the correlation between increased co-worker support and reduced job demand among nurses in other countries (5, 19, 31) was also presented among provincial nurses in Vietnam. This can be explained by the fact that generally nursing work requires much collaboration and teamwork with other nurses and healthcare professionals such as physicians to provide patients' care. Any kind of support, even a good relationship with colleagues, might significantly contribute to the decreased workload, resulting in improved nurses' mental well-being (3), and self-perceived job control. it is suggested that to increase job control, team-oriented organizational structures are advantages, as compared with traditional hierarchical nursing structures (32). This mechanism facilitates the guiding process from senior nurses or head nurse to younger nurses in the same department, improving their job control and performance. In addition, a double line of command (from the nursing department and physicians) may reduce nurses' job control. Hence, a good nurse-physician relationship may improve job control among nurses (32). On the other hand, the improved nursing skills and capability to make decisions would help nurses work more effectively and effortlessly, contributing to the reduction of perceived job demand.

Interestingly, a number of on-duty nights per week positively correlated with job demand and job control in our study. Night duty is a specific task for health workers and has a significant impact on health due to changes in the biological normal circadian rhythm. Shiftwork, especially the night shift, affects sleep quality. The combination of sleep deprivation and working when bodily functions are restricted can cause severe fatigue and insomnia, difficulty in good job performance, and an increased risk of accidents and stress. Therefore, night duty might increase job demands. Another study among Vietnamese dermatology healthcare workers reported an association between high strain (high demand and low control) and more night shifts per week (33). A positive correlation between excessive work hours (morning or night) and job control in this study mirrors Sasaki et al. among nurses in a Vietnamese national hospital with a high level of job control (26). Healthcare workers are likely to have longer working time and

higher job control than other occupations (34). Nurses with high control in Vietnamese hospitals might work actively with authority, which would lead to a longer-time work or more assignment of complex tasks such as night shift. However, excessive workload, even with high control, increase the risk of low self-rated health (35) and work-life imbalance (21-23), lower job satisfaction (21, 22), poor performance (24), and high intentions of leaving (10, 16, 23). Increasing nursing staff to decrease the number of night shifts and workload is challenging because of current regulations on personnel allocation, shortage of nurses, and limited expenditure on personnel. Hence, nurse managers should develop a suitable working organization and schedule appropriate for the need and capacity of nursing staff in their department.

Our study showed that nurses with an opportunity for promotion expressed higher job control (p=0.011). This was consistent with the Italian study results reporting that Rewards positively correlated with Job control (31). Promotion, recognition of employee's contribution, highly motivate worker's performance. When an individual is promoted to a higher position, he/she will have more authority to make work-related decisions, resulting in higher control of their job. It is also understandable since employees with the best performance and capacity would likely to be promoted. Our finding implies that support to improve job control should target nurses in a lower position at work.

Limitations

Our study encountered a number of limitations. Firstly, the disadvantage of a self-reported scale might result in recall and influence of individual factors to the perception of job demand and control. The study topic is a personal, subjective sensation and understanding and not an objective quantification. Secondly, within an institution-based survey, nurses might conceal or underreport their job demand level. In addition, nurses with a demanding job might be reluctant to participate in the study, which resulted in underreporting job demand. However, this limitation might be minimized with a high participation rate of this study (over 80%). Finally, physical and mental health conditions that might affect individuals' self-perception were not collected and included in the analysis.

CONCLUSIONS AND RECOMMENDATIONS

Nurses in the provincial tertiary hospital reported moderate levels of job demands and job controls at work. The associations between high support at work and reduced job demand, and increased job control highlight the necessity of professional support for nurses. The investigated hospital in particular and other provincial hospitals should create appropriate work arrangements to encourage supervisor and co-worker support among nurses, especially those with more on-duty nights per week or less opportunity to be in a management position. Future studies could investigate the psychological work environments of clinical nurses at provincial hospitals in other regions of Vietnam such as river deltas, central highlands or coastal lowlands.

Table 3. Association between individual and work characteristics and self-reported job demand and job control among study nurses (N= 261)

Factors*	Subgroups	Job control							Job demand						
		Mean	SD	Crude analysis[a]		Multivariate analysis[b]			Mean	SD	Crude analysis[a]		Multivariate analysis[b]		
				t/ F/ r	p	Beta	t	p			t/ F/ r	P	Beta	t	p
Receiving supervisor support	Never	62.44	6.23	11.68	<0.001	0.29	4.15	≤0.001	31.22	3.70	1.22	0.302	0.02	0.31	0.757
	Sometime	65.79	5.45						29.10	3.26					
	Frequent	67.79	5.16						29.60	3.95					
	Very frequent	72.94	6.79						29.76	4.70					
Receiving co-worker support	Sometime	64.74	4.62	12.43	<0.001	0.12	1.66	0.097	29.02	3.52	2.60	0.076	0.16	2.05	0.041
	Frequent	67.01	5.80						29.31	3.46					
	Very frequent	71.04	6.04						30.85	4.67					
Verbal abuse from patients and their families	Never	66.34	5.08	5.16	0.002	-0.03	-0.44	0.664	29.00	2.84	0.70	0.552	0.05	0.77	0.443
	Sometime	67.28	5.79						29.57	3.93					
	Frequent	66.29	6.16						28.86	4.10					
	Very frequent	52.00	14.14						31.50	3.54					
Promotion opportunity	Yes	68.08	6.37	10.29	0.002	-0.16	-2.55	0.011	29.11	3.44	1.38	0.242	0.09	1.32	0.188
	No	65.82	5.05						29.64	3.79					
Monthly income in 2019				-0.12	0.049	-0.08	-1.18	0.237			-0.04	0.542	0.01	0.09	0.926
Night shift per week				0.12	0.059	0.17	2.88	0.004			0.19	0.001	0.20	3.18	0.002

[*] Sex, age, labor contract, satisfying with the relationship with co-workers, drinking and smoking status, education attainment, and years of service were insignificantly associated with Job demand and Job control in both crude and multivariate analyses with $p>0.05$.

[a] Crude analysis between Job control/ Job demand and investigated factors using t-test (t) for binary variables or ANOVA (F) for variables with more than two categories or correlation coefficient (r) for continuous variables

[b] Multivariate analysis using Linear regression

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