Development and Validation of a Job Resources Scale for Thai Nurses

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Abstract

Job resources are work conditions that can help individuals achieve their career goals. The concept has a potential application in the nursing profession but a nursing job resources scale based on the Thai context does not yet exist. The purpose of this study was to develop and validate a scale that assessed the perceived levels of job resources of Thai nurses in the private sector. The study employed the exploratory sequential mixed-methods design (qualitative research followed by quantitative research) and was composed of two phases. First, the scale development began with individual interviews to explore what work conditions adequately represented the job resources of Thai nurses, followed by item generation and assessment, exploratory factor analysis, and reliability analysis. Second, the scale validation was achieved via confirmatory factor analysis, and convergent and concurrent validity analysis. The sample, consisting of 761 Thai nurses from 16 private hospitals in Bangkok, was randomly divided into three parts for different analyses, which resulted in the 15-item job resources scale (Cronbach's alpha coefficient = .90), with three dimensions (CMIN/df = 1.50, CFI = .98, TLI = .97, RMSEA = .05, and SRMR = .04) that had the potential for use in studies in various disciplines related to nurse populations in Thailand. The indicators of the newly-developed job resources scale not only can enlighten educators concerning the crucial factors regarding the nursing job resources in the Thai context, but can also be used by practitioners as a guideline to increase professional accomplishments.

Keywords: Job Resources, Scale Development and Validation, Thai Nurses

Introduction

Job resources refer to physical, psychological, social, or organizational work conditions that can help individuals achieve their career goals, to grow and develop, as well as to mitigate the negative effects inherent in the job demands on individuals (Demerouti, Bakker, Nachreiner, & Schaufeli, 2001). The concept of job resources has received a great deal of attention from various researchers because it can be applied to explaining many of the interesting factors relevant to various disciplines, such as self-efficacy, self-esteem, and optimism in psychology (Llorens, Schaufeli, Bakker, & Salanova, 2007; Xanthopoulou, Bakker, Demerouti, & Schaufeli, 2009a), turnover intention in human resources (Babakus, Yavas, & Karatepe, 2008), pupil misbehavior in education (Bakker, Hakanen, Demerouti, & Xanthopoulou, 2007), physical health and safety outcomes (e.g., unsafe behavior) in health and safety (Nahrgang, Morgeson, & Hofmann, 2011; Rothmann & Essenko, 2007), and even innovative work behavior, organizational innovativeness, and financial returns in organization development (Adler & Koch, 2017; Huhtala & Parzefall, 2007; Xanthopoulou, Bakker, Demerouti, & Schaufeli, 2009b).

In particular, job resources are one of the main predictors of the job-demands resources (JD-R) model, which is the job stress model of choice to study positive and negative work conditions in organizations that affect employees' work engagement and burnout, and has been widely applied to several work problems (e.g., absenteeism or turnover intention) among various occupations (e.g., call-center employees, industrial workers,

and health care professionals) in various countries (e.g., Australia, China, Spain, and the USA; Schaufeli & Taris, 2014).

In this regards, Montgomery, Spânu, Băban, and Panagopoulou (2015) suggested that this model can most properly explain the nursing profession, which is inherently stressful. Consequently, the model has a potential application in the Thai healthcare industry, which has been experiencing the big issue of nurse shortages for decades (Abhicharttibutra, Kunaviktikul, Turale, Wichaikhum, & Srisuphan, 2017), going against the prosperity of medical tourism in Thailand (Connell, 2013), propelled mainly by Thai private hospitals (Kasikorn Research, 2016).

However, each occupation might have specific work environments of its own that affect the well-being of the people that are working in that profession (Demerouti et al., 2001) and a nursing job resources scale does not yet exist in Thailand. Consequently, in order to ensure the quality of future studies on job resources, as a single construct or as part of the JD-R model, in the Thai healthcare industry, there remains a need for a valid and reliable job resources scale based on the existent Thai nurse work environment. In response to this issue, the purpose of this study was to develop and validate a scale that assessed the perceived levels of job resources among Thai nurses. The newly developed scale could not only be used by researchers in various disciplines to study topics relevant to nursing job resources but also by practitioners to assess the perceived levels of each job resource available in a hospital, which would be followed by the development of a plan to provide nurses with more certain resources necessary to achieve work goals.

This study was composed of two main phases. First, scale development comprised the interview with Thai nurses concerning perceived job resources in the Thai private hospital context, an item generation and assessment, exploratory factor analysis (EFA), and reliability analysis. Second, scale validation was conducted through confirmatory factor analysis (CFA), convergent validity analysis, and the employment of the JD-R model, which identifies that job resources can predict work engagement and burnout, in order to assess the concurrent validity of the scale.

Literature Review

The aim of the review of the literature was to discover the potential work conditions that could represent nurse job resources. In order to achieve this aim, existing job resources scales, as well as the work environmental factors that previous nursing studies have used as job resources, were reviewed.

First, job resources were found to be part of the job demands-resources scale (Rothmann, Mostert, & Strydom, 2006), which could be utilized to measure the domains in different occupations. The scale comprises both job demands factors and job resources factors, and the latter are composed of three dimensions, which are growth opportunities (i.e., having sufficient opportunities to learn and to be self-reliant at work, such as job variety), advancement (i.e., the progress within one's work, such as training and career opportunities), and organizational support (i.e., social support and the opportunity to relate to others in the organization).

Second, previous job resources studies among nurses usually have selected certain work aspects to represent the domain of interest. Among these studies, the most frequently-used factors are social support (e.g., supervisor and coworker support; Blanco-Donoso, Garrosa, Moreno-Jimenez, de Almeida, & Villela-Bueno, 2017; Shahpouri, Namdari, & Abedi, 2016; Sundin, Hochwälder, & Lisspers, 2011; Zito, Cortese, & Colombo, 2016). The second group of factors frequently employed is the opportunity to learn and grow (e.g.,

training and career advancement; Hu, Schaufeli, & Taris, 2017; Moloney, Boxall, Parsons, & Cheung, 2018; Vander Elst et al., 2016). Apart from those commonly-used variables, other possible nursing job resources are senior management support (Moloney et al., 2018), organizational justice (Shahpouri et al., 2016), relationships with physicians and patients (Jourdain & Chênevert, 2010), teamwork (Montgomery et al., 2015), access to information via computer equipment (D'Emiljo & du Preez, 2017), and job security (Bhatti, Hussain, & Al Doghan, 2018).

In conclusion, the potential work conditions that could become factors in nursing job resources might be categorized into two groups—person-related factors (e.g., supervisor and peer support, and relationships with doctors and patients), and organization-related factors (e.g., professional training, opportunities for career advancement, and job security). Because the previously-mentioned studies on nurses have been based on an international context, not all results can be applied to Thai nurses, and there remains a need for further investigation of the actual facets of Thai nurses' job resources.

Methods and Results

This study employed the exploratory sequential mixed-methods design (qualitative data collection and analysis followed by quantitative data collection and analysis) which is a procedure that most researchers use to develop an instrument, in case an existing instrument is not available (Creswell, 2009). The scale development and validation were composed of two main phases. The purpose of the first phase, scale development, was to determine the potential factors in the Thai nursing job resources scale. In this regard, individual interviews were conducted, followed by item generation, content validity assessment by experts, EFA, and Cronbach's alpha coefficient analysis. The purpose of the second phase was to assess the validity of the newly-developed scale through the CFA, and convergent and concurrent validity analysis.

Population

In this study, the population was Thai registered nurses working for private hospitals in Bangkok. Letters regarding data collection for research work, issued by the institute's authority, were mailed to 54 private hospitals in Bangkok, along with other documents (e.g., introductory letters, the assurance of confidentiality, the main researcher's bibliography, and the questionnaires) for their perusal. Finally, data collection was permitted by authorities of 16 hospitals and the questionnaires were delivered to the contact persons at each hospital, who distributed and collected the questionnaires for the researchers. One thousand and twenty questionnaires were distributed, 882 were returned, and 761 questionnaires could be used for further analysis. Data were randomized to be used at each step of the analyses, as shown in Table 1.

Table 1 Demographic Information about the Randomized Sample

Demographic Information	Phase 1: Scale Development	Phase 2: Scale Validation		Total
		Part 1	Part 2	
Number	150	211	400	761
Age (years)	22-60	22-60	22-63	22-63
Experience (year)	1-38	1-40	1-41	1-41
Female	100%	97%	97%	97%
Single	69%	74%	69%	70%
Bachelor's degree	94%	96%	95%	95%

Table 1 (Cont.)

Demographic Information	Phase 1: Scale Development	Phase 2: Scale Validation		Total
		Part 1	Part 2	
Staff level	87%	83%	83%	84%
Analysis	EFA	CFA	SEM	
	Cronbach's Alpha	AVE & CR		

Phase 1: Scale Development

In this phase, in-depth, semi-structured, face-to-face or telephone individual interviews were conducted in order to explore what work conditions were of critical importance to Thai nurses in terms of job resources, followed by item generation and assessment, EFA, and Cronbach's alpha coefficient analysis.

Interview Procedure

The inclusion criteria for the interviews were Thai registered nurses that were working for Thai private hospitals for more than two years. Finally, the key informants were 11 registered nurses in various positions (i.e., nurse managers, a supervisor nurse, a head nurse, a charge nurse, and staff nurses) between the ages of 24 and 47, from seven private hospitals in Bangkok. The overall nursing experience ranged between 2 and 25 years.

The interviews began with one open-ended question, which was "What are some of the things that help your work go easier for you?" This allowed the participants to describe their own opinions based on their work experience from the past until the present. Apart from the main question, areas of work conditions from the literature review (e.g., training and career advancement) were mentioned, in case the participants had not referred to those work characteristics during the interviews. All of the interviews were recorded for further analysis.

This study adapted the data management method suggested by Halcomb and Davidson (2006). The method employed in this study was as follows. Field notes were made during the interviews and reflections on the interviews were made right after each interview in order to identify further ideas, comments, or perceptions while the researcher's memory remained fresh. Then the recordings were reviewed in accordance with the researcher's notes, which were amended until the main researcher was certain that they adequately represented the interview. Therefore, the previous interview provided the main researcher with a direction for the next interview. After all of the interviews were completed, the process of content analysis was undertaken in order to extract common themes emerging from the interviews. The accuracy and comprehensiveness of the themes were verified by the co-author and the other two experts in human resource development and psychology in order to enhance the creditability of the study. According to the content analysis, the work conditions that the Thai nurses perceived as job resources were supervisors' support, colleagues' support, equipment, training, rules and standards of hospitals, and career advancement.

Item Generation

The items were developed based on the information from the interviews. The scale was composed of 15 items, 3 items for supervisor support, 4 items for coworker support, and 2 items each for equipment, training, rules, and career advancement. A small number of resource items that truly represent the essential job resources of Thai nurses might decrease response bias resulting from the boredom or fatigue of participants (see Hinkin, 2005).

Four nurses from the interviews offered advice on item revisions. Subsequently, five experts were requested to examine the content validity of the items based on the index of item-objective congruence (IOC). All 15 items were retained because they scored greater than .50, while some items were revised according to the

suggestions of the experts. Consequently, the preliminary set of 15 items, using a five-point Likert scale ranging from 1 (not at all true) to 5 (completely true), was administered to the registered nurses in the Thai private hospitals, and the EFA and Cronbach's alpha analysis were conducted in order to refine the scale.

Exploratory Factor Analysis and Cronbach's Alpha Coefficient Analysis

Scale refinement was achieved by conducting EFA and Cronbach's alpha coefficient analysis. EFA was conducted in order to examine the loading patterns of the items and to reduce the larger number of items to a smaller number of factors (Yang, 2005). Items with factor-loading values on the primary factor greater than .50 were retained. In addition, items with a difference in factor-loading values between factors less than .20 (Howard, 2016) were eliminated from the scale. In addition, Cronbach's alpha was conducted in order to measure internal consistency reliability, which indicates strong item covariance of a new scale (Hinkin, 2005). Items that possessed item-total correlation values less than .30 were removed from the scale.

Regarding the EFA, principal component analysis and varimax rotation were selected for factor extraction. The results from the EFA suggested having 15 items with three dimensions, which accounted for 66% of the variance. The first factor, labeled organizational support, had eight items and accounted for 32% of the variance. The second factor, labeled peer support, contained four items and accounted for 19% of the variance. The last factor, labeled supervisor support, had three items and accounted for 15% of the variance (see Table 2).

The results of the Cronbach's alpha coefficient analysis showed that the scale, as well as each dimension, had good internal consistency, and the item-total correlations ranged from .32–.77 (see Table 3). Consequently, all of the items were retained for the scale validation in the next phase.

Table 2 Items and Factor Loadings for the 15-Item Job Resources Scale (N = 150)

Job Resources' Indicators	Factor 1	Factor 2	Factor 3
1. When I need some advice to solve work problems, my supervisor will help me.	.28	.22	.76
2. When I cannot solve work problems by myself, my supervisor will step in and help me.	.11	.24	.83
3. When there are not enough nurses around, my supervisors will join in and work together with the nursing team.	.08	.00	.80
4. My colleagues encourage me in my work.	.20	.86	.02
5. My colleagues give me helpful advice on how to fix my work problems.	.21	.77	.25
6. When I am tied up with my personal duties, my colleagues are willing to stand in for me.	.24	.69	.15
7. We work as a team.	.30	.69	.12
8. My unit has sufficient equipment for working.	.72	.20	.07
9. My unit has a computer system that allows me to quickly access the information needed.	.72	.13	.17
10. I have received sufficient training to work effectively.	.71	.32	.31
11. I have received training from which I have gained truly practical knowledge for my work.	.68	.35	.31
12. I clearly know the career path of the nursing profession in this hospital.	.75	.15	.02
13. If I work to the best of my ability, I have an opportunity to grow and advance in the nursing career path in this hospital.	.74	.25	−.01
14. The hospital has standard procedures that enable me to work confidently.	.82	.18	.23
15. The hospital provides clear standard operating procedure manuals that make it easier for me to do the job.	.79	.20	.14
Eigenvalues	4.74	2.85	2.29
% of Variance	31.58	18.98	15.24
Cumulative % of Variance	31.58	50.56	65.80

Table 3 Cronbach's Alpha Coefficient Analysis of the Three-Factor Job Resources Scale ($N = 150$)

Scale / Factors	No. of Items	Item-Total Correlation	Cronbach's Alpha
Job Resources	15	.32-.77	.90
Supervisor Support	3	.53-.67	.75
Peer Support	4	.59-.71	.82
Organizational Support	8	.65-.80	.91

Phase 2: Scale Validation

The results from the EFA and Cronbach's alpha coefficient analysis revealed that the job resources scale, including 15 indicators, was composed of three dimensions with a good level of internal consistency. In this phase, in order to assure the validity of the new scale, CFA, and convergent and concurrent validity analysis, were carried out.

CFA was conducted to test whether the structure of the job resources scale was a three-factor model, based on the results of the preliminary factor analysis, with new data ($N = 211$). In this study, the criteria for determining an adequate fit of the model were as follows: a ratio of CMIN/df less than 3 (Bollen, 1989), a CFI value greater than .90 (Yang, 2005), a TLI value greater than .90 (Hair, Anderson, Tatham, & Black, 1998), an RMSEA value less than .08 (Burnette & Williams, 2005), and an SRMR value less than .08 (Hu & Bentler, 1999).

Convergent validity, a form of construct validity, was conducted in order to test whether items belonging to the scale were supposed to share a high proportion of variance in common (Hair et al., 1998). One way to estimate the amount of convergent validity of a newly-developed measure is to consider the values of the average variance extracted (AVE) and construct reliability (CR) of the scale, which should be higher than .50 and .70 respectively (Fornell & Larcker, 1981).

Concurrent validity, a form of criterion-related validity, was evaluated by considering the relation between the scores on the scale and those on the criterion scales, which were measured at the same time (Lounsbury, Gibson, & Saudargas, 2006). Based on the JD-R model, job resources have been found to be able to predict work engagement and burnout among Thai and international nurses (Chou, Hecker, & Martin, 2012; Laschinger, Grau, Finegan, & Wilk, 2012; Moloney et al., 2018; Sundin et al., 2011; Thirapatsakun, Kuntonbutr, & Mechinda, 2014; Vander Elst et al., 2016). Consequently, in this study, work engagement and burnout were used as the criterion variables for relating to job resources. The concurrent validity was tested using structural equation modeling (SEM) and the criteria for determining the adequate fit of the model were the same as those for the CFA.

Instruments

Job resources were measured with the recently-developed 15-item job resources questionnaire from the previous phase, which consisted of three subscales: three items for supervisor support, four items for peer support, and eight items for organizational support. The response format ranged from 1 (not at all true) to 5 (completely true).

Burnout was measured using the Oldenburg Burnout Inventory (OLBI; Demerouti, Mostert, & Bakker, 2010), which is composed of two subscales: eight items for exhaustion and eight items for disengagement. The response format ranged from 1 (strongly disagree) to 4 (strongly agree). In our study, the Cronbach's alpha coefficient of the OLBI was .86.

Work engagement was measured via the Utrecht Work Engagement Scale (UWES; Schaufeli, Salanova, González-romá, & Bakker, 2002). The scale comprises three subscales: six items for vigor, five items for dedication, and six items for absorption. The response format ranged from 0 (never) to 6 (always or every day). In our study, the Cronbach's alpha coefficient of the UWES was .96.

Part 1: Confirmatory Factor Analysis and Convergent Validity Analysis

The CFA results for the three-factor model revealed that the goodness of fit was acceptable (CMIN/df = 1.50, CFI = .98, TLI = .97, RMSEA = .05, and SRMR = .04). The range of factor loadings was between .58–.89 at a .01 significance level (see Figure 1).

The values for the AVE and CR of the scale were .54 and .95, which were higher than the recommended level of .50 and .70 respectively. It was concluded then that the convergent validity of the instrument was adequate.
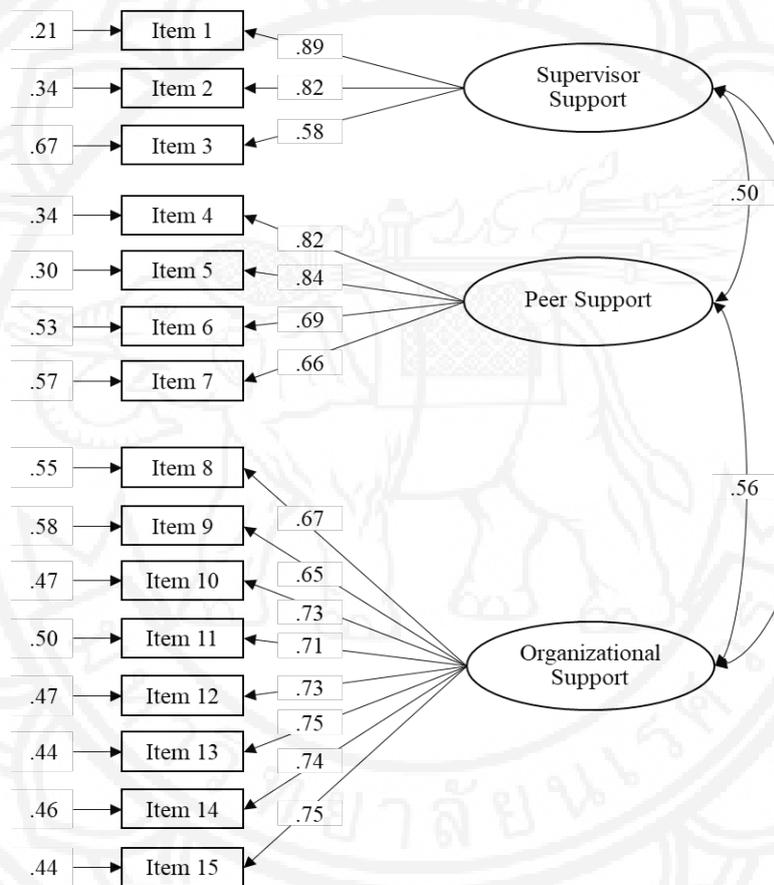

Figure 1 Confirmatory Factor Analysis of the Three-Factor Job Resources Scale (N = 211)

Part 2: Concurrent Validity Analysis

The results from the SEM revealed that the goodness of fit of the model was acceptable (CMIN/df = 2.60, CFI = .99, TLI = .98, RMSEA = .06, and SRMR = .03). Both paths in the model were significant and in the theorized direction. Job resources had a positive relationship with work engagement (β = .41, p < .01) and had a negative relationship with burnout (β = -.41, p < .01), which indicated that job resources explained 17% of the variance in both work engagement and burnout (see Figure 2).
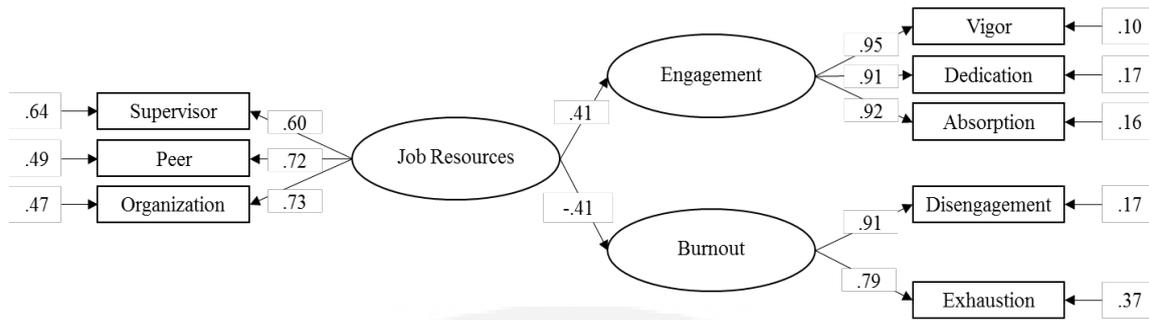
Figure 2 Concurrent Validity Analysis for the Newly-Developed Job Resource Scale (N = 400)

Discussion

The purpose of this study was to develop and validate a job resources scale for Thai nurses. In order to achieve this aim, the researchers conducted individual interviews, item generation, EFA, and Cronbach's alpha coefficient analysis for the scale development, followed by CFA and the validity analyses for the validation of the newly-developed scale.

The results from the first phase suggested that job resources are a multidimensional construct, including supervisors' support, colleagues' support, equipment, training, rules and standards, and career advancement. The indicators underlying each category were generated in congruence with the results from the interviews, which represented the actual work situations that Thai nurses in private hospitals in Bangkok experience. Subsequently, EFA and CFA were conducted and the six categories of the job resources during the first phase were reduced to three factors as follows.

The first factor, supervisor support, comprised three items. On occasion, nurses encounter various kinds of problems (e.g., conflicts between departments) that they could not solve by themselves due to their limited ability or skills, or limited authority. In this case, supervisor support, in terms of information or action, is very important for assisting nurses—not only to overcome those obstacles at work but also to lessen the stress inherent in those problems. This factor lent support to previous studies in the literature (Sundin et al., 2011; Zito et al., 2016) that stressed the importance of supervisor support as a nursing job resource.

The second factor, peer support, comprised four items. In the hospital setting, no one can understand nurses better than the nurses' colleagues, who experience common difficulties. Coworkers not only offer the best consolation when a person is disappointed at work, but also provide suggestions or even take action in order to address the problem. The outcome of helping one another on a team represents the idea of good teamwork. This dimension was in good agreement with studies conducted by Blanco-Donoso et al. (2017) and Shahpouri et al. (2016), that accentuated the value of coworker support in increasing engagement and decreasing burnout.

The third factor, organizational support, comprised eight items. Organizations play an important role in providing nurses with required resources so that they can complete their work goals effectively. The resources that can be supported by a hospital are, for instance, equipment and materials (e.g., medical supplies, computers, tablets, or software), effective training programs, the opportunity for career advancement, and clear work procedures and comprehensive work manuals. When lacking this support from a hospital, even nurses with high levels of work skills find it difficult to achieve their work goals. These results thus obtained were

compatible with the study of D'Emiljo and du Preez (2017), who emphasized the significance of equipment, learning opportunities, and career advancement in enhancing the nurse's well-being.

In summary, the analyses of the first and second phases of the present study resulted in the 15-item job resources scale of Thai nurses, with three factors, which were supervisor support, peer support, and organizational support (CMIN/df = 1.50, CFI = .98, TLI = .97, RMSEA = .05, and SRMR = .04), rated using 5-point Likert-type scale, ranging from 1 (not at all true) to 5 (completely true). The results, also, provided sufficient evidence for the reliability (α = .90), convergent validity (AVE = .54 and CR = .95), and concurrent validity with OLBI and UWES (CMIN/df = 2.60, CFI = .99, TLI = .98, RMSEA = .06, and SRMR = .03) based on the concept of the JD-R model.

The findings emphasized the inappropriateness to include the other broad work environments (e.g., job security and relationship with physicians) used in previous international nursing studies as job resources for Thai nurses. In addition, although some of the dimensions of the job resources scale for Thai nurses (e.g., supervisor and coworker support) were similar to those of the job demands-resources scale (Rothmann et al., 2006) for general occupations, other dimensions (i.e., equipment and rules and standards) were unique to the Thai nursing context. These accentuated the importance of the development of a particular job resources scale for Thai nurses.

Implications for Practice

Two areas in which the job resources scale might be applied are as followed. First, human resource practitioners or nurse managers could use the indicators of the scale as a guideline for the design of positive work environments, which are necessary for Thai nurses to work efficiently with higher levels of work engagement and lower levels of burnout. Practitioners could begin by allowing all nurses in a hospital to complete the questionnaire and the results could provide useful information (e.g., means and standard deviations) about the extent to which job resources are available in the hospital. Then each nurse manager could discuss the details, such as the specific additional support that nurses under supervision seek from supervisors, peers, or the organization. This process could help identify the scarce but important job resources that could truly enhance work performance, as well as the well-being of nurses. Subsequently, the hospital could make a plan to provide nurses with those desirable resources.

Second, researchers in different fields (e.g., psychology, health and safety, and change management) could use this scale to study any topic of interest within their fields related to nursing job resources, for instance, the effects of job resources on psychological states, unsafe behavior, and innovative behavior. Additionally, human resource personnel or nurse researchers could use the scale as part of the JD-R model in order to study the turnover intention or the intention of nurses to discontinue their career nationwide. This might partially suggest some solutions for the issue of the nurse shortage in Thailand.

Limitations and Recommendations

This study entirely developed and validated the job resources scale based on the opinions of nurses in many private hospitals in Bangkok, Thailand. Consequently, the most important limitation lies in the fact that the scale can perhaps only be appropriately used with Thai nurses in the private sector. Future work is encouraged to use two different samples (i.e., nurses from both public and private hospitals in Thailand) and different types of

analyses (e.g., means, standard deviations, Cronbach's alpha coefficient analysis, EFA, CFA, and SEM) to psychometrically test the scale, as well as to compare the structure of the scale in the public sector nurses with that in the private sector nurses. In addition, prior to immediate application of the scale in other nursing contexts (e.g., nurses working for public hospitals in Thailand, or in other countries), at least, the scale needs further reliability and validity analyses. Finally, longitudinal studies are encouraged to be carried out in order to test other types of validity, such as predictive validity and nomological validity, which were not included in this study.

Acknowledgments

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