



Original Article

Development and psychometric testing of the Chinese nurses job satisfaction scale

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Abstract

A proposed Chinese Nurses Job Satisfaction Scale was developed and its psychometric properties tested. Instrument development was conducted in four phases. The constructs and items of the instrument were developed from literature review and were confirmed by interviewing six Chinese clinical experts in phase I. During phase II, five experts evaluated the scale's content validity. In phase III, exploratory factor analysis was used to examine the instrument constructs ($n = 302$). In phase IV, a multi-stage random sampling was used to recruit 510 subjects to examine the proposed model by confirmatory factor analysis. The Content Validity Index of the instrument for items ranged from 0.8 to 1.0. Seven factors were extracted from exploratory factor analysis, which explained 71.47% of the total variance. A confirmatory factor analysis supported the modified measurement model of nurses' job satisfaction with 34 items. The scale overall internal consistency Cronbach's alpha coefficient was 0.93.

Keywords: exploratory factor analysis, scale development, nurse job satisfaction, second-order confirmatory factor analysis

1. Introduction

A national survey showed that 45% of Chinese nurses were dissatisfied with their jobs, which was measured by only a single item, nurses' evaluation of satisfaction or dissatisfaction with their jobs (You *et al.*, 2013). However, nurses' job satisfaction is very important for clinical nursing practice because it has been found to be significantly related to nurse outcomes, such as nurses' job retention (Cowin *et al.*, 2008), intention to leave (Huang, 2012), burnout (Kalliath & Morris, 2002), and job performance (Pan *et al.*, 2013). In addition, nurses' job satisfaction was also found to significantly influence patient outcomes, such as quality of care (Mohr *et al.*, 2011) and patient satisfaction (Szecsenyi *et al.*, 2011).

Therefore, it highlights the importance of maintaining nurses' job satisfaction in the nursing profession.

Job satisfaction is a psychological construct, which is considered as an evaluation of an affective reaction to a job (Locke, 1976). It has been described as a multidimensional concept. After reviewing the literature, a substantial degree of agreement exists among researchers regarding the components of job satisfaction, including promotion and individual growth (Yang *et al.*, 2012), recognition and praise (Mrayyan, 2006), responsibility and control (Moumtzoglou, 2010), remuneration (salary, vocation, fringe benefit) (Sriratanapapat *et al.*, 2012), work conditions (Hu, 2007), work itself (Stamps & Piedmonte, 1986), administration and organizational policies (Cao, 1998), interaction (Hu & Liu, 2004), and family and work balance (Mueller and McCloskey, 1990). These literatures provide much evidence of the job satisfaction components to the development of instruments to evaluate job satisfaction.

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According to Waltz *et al.* (2010), the constructs of instruments may be different in various populations. Thus, the instruments used to measure nurses' job satisfaction were reviewed as follows. The comprehensive review revealed that the development of nurses' job satisfaction is generally based on motivation theories, which included both content motivation theories (Herzberg's Two Factor Theory and Maslow's Hierarchy of Needs Theory) and process motivation theories (Adams's Equity Theory, Vroom's Expectancy Theory, and Burns' Motivation Theory). For example, Stamps and Piedmonte (1986) developed the Index of Work Satisfaction (IWS) to measure nurses' job satisfaction based on both the content and process approach of motivation theories. Mueller and McCloskey (1990) developed the Mueller–McCloskey Satisfaction Scale (MMSS) to measure hospital staff nurses' job satisfaction, which is based on Maslow's Human Need Theory and Burns' Motivation Theory. Sriratanaprat *et al.* (2012) developed Thai Nurses' Job Satisfaction Scale (TNJSS) to measure hospital nurses' job satisfaction based on Herzberg's Two Factor Theory and Vroom's Expectancy Theory. Although IWS, MMSS, and TNJSS were developed based on both process and content motivation theories, they were developed in different countries. The constructs of nurses' job satisfaction used in other countries may not be the same in China. This is because Chinese culture and healthcare system are not the same as other countries. However, a scale for Chinese nurses' job satisfaction has not been found that was developed based on both process and content motivation theories to identify how Chinese contemporary nurses feel about their jobs under the current healthcare system.

The measurement of Chinese nurses' job satisfaction was commonly conceptualized based on Herzberg's Two Factor Theory and Maslow's Hierarchy of Needs Theory, which are grouped as the content motivation theory (Sullivan & Decker, 2009). For example, it has been found that Cao (1998) developed a 62-item Nurse Job Satisfaction Scale (NJSS) to measure Chinese clinical nurses' job satisfaction in Xi'an City. Hu (2007) developed another 38-item Nurse Job Satisfaction Scale in Chinese (NJSS-C) to measure clinical nurses' job satisfaction in Shanghai City. However, these two instruments can only measure nurses' feelings of desired needs. These instruments cannot measure nurses' equitable or valuable feelings. This is because the theoretical underpinning of the content motivation theory did not reflect nurses' job value or nurses' perception of equity in the current work environment of Chinese hospitals (Liu, 2014).

Compared with content motivation theory, the benefits of process of motivation theories emphasized "how the motivation process works to direct an individual's effort into performance" (Sullivan & Decker, 2009, p 225). For example, Vroom's Expectancy Theory suggested that "individuals are motivated by their expectancies about future outcomes and by the value they place on those outcomes" (Vroom, 1964). Vroom's Expectancy Theory included three important components, which are expectancy, instrumentality, and valence.

A person is motivated through expectancies that (1) efforts will lead to acceptable performance (expectancy), (2) performance will be rewarded (instrumentality), and (3) the value of the rewards (valence). Adams's Equity Theory asserted that job satisfaction depends on an individual's perceived fairness or equity in the work settings. The "fairness or equity" find out the balance of inputs and outputs by individual's perceptions or compare self-situation to others (Adams & Bond, 2000). Therefore, the process of motivation theories can reflect job satisfaction's characteristics of expectancy of job value and perceived job equity.

Meanwhile, in the current Chinese healthcare system, hospital managers have recognized the importance of increasing nurses' perception of expected job value and job equity in order to enhance nurses' working performance and stabilize the nursing workforce. Two healthcare policies have been established to make nurses feel more equitable and valuable in the work settings. The policy of "equal pay for equal work" was implemented by the State Council of the People's Republic of China (2008). This statute stipulated that nurses should be fairly and equitably paid based on their workload regardless of employment status, age, gender, or ethnic groups. In addition, the Ministry of Health of the People's Republic of China (2010) implemented the "good nursing care programs" in order to increase quality of nursing care and nurses' expected job value. However, we did not find the scale for measuring Chinese nurses' job satisfaction including the attributes of nurses' expectancy of job value and perceived job equity.

Therefore, when hospital managers measure contemporary nurses' job satisfaction, it is important to know what are nurses' expectations for job equity and job value in order to stimulate nurses' good behavior. The purpose of this study was to develop the Chinese Nurse Job Satisfaction Scale (CNJSS) based on the content (Herzberg's Two Factor Theory) and process (Adams's Equity Theory and Vroom's Expectancy Theory) of motivation theories in order to best measure contemporary Chinese nurses' job satisfaction under the current healthcare system nationwide.

2. Materials and Methods

2.1 Instrument development and testing procedures

The cross-sectional survey design was used in this study, which aimed to develop and examine the psychometric properties of the CNJSS in four phases: (1) Constructs and items generation of the initial CNJSS, (2) Content validation of the initial CNJSS, (3) A pilot testing of the initial CNJSS, and (4) psychometric testing of the final CNJSS.

2.1.1 Phase I: Constructs and items generation of the initial CNJSS

A review of literature revealed that the attributes of nurses' job satisfaction have not been clearly determined.

Before developing CNJSS, the concept of nurses' job satisfaction was analyzed by using Walker and Avant's concept analysis procedures. Dictionaries, books, theses/dissertations, and articles published on Blackwell, CINAHL, PsychInfo, and Medline databases were reviewed. Based on both the content and motivation theories, the primary investigator (PI) identified the attributes of nurses' job satisfaction as (1) fulfillment of desired needs within the work setting, (2) happiness or gratifying emotional responses towards working conditions, and (3) expectancy of job value and perceived job equity (Liu, 2014; Liu *et al.*, 2015). The first and second attributes are mainly based on content motivation theory of Herzberg's Two Factor Theory. The third attribute is mainly based on process of motivation theories of Adams's Equity Theory and Vroom's Expectancy Theory. Therefore, we concluded that the theoretical definition of nurses' job satisfaction is defined as "nurses' positive emotional response to the work conditions that support their desired needs as the result of their evaluation of the value or equity in their work experience."

The results of concept analysis and literature review also determined eight components of nurses' job satisfaction with 37 items, including individual growth and promotion (3 items), recognition (6 items), responsibility and control (6 items), salary and fringe benefits (6 items), work conditions (5 items), administration (3 items), interaction (5 items), family and work balance (3 items).

According to Waltz *et al.* (2010), a qualitative interview can illustrate a concept based on the individuals' perception of their society. Therefore, clinical nursing experts who were knowledgeable about nurses' job satisfaction were interviewed. All of the selected experts for interviewing met the qualification as having a professional title of at least associate professor; working in the clinical setting and holding a Chinese Registered Nurses' License for more than 20 years; familiar with the concept of nurses' job satisfaction; providing a social service, such as the nurse association. These six experts represented the northeast, south central, and southwest areas of China.

The interview questions carried out included (1) How do you describe the concept of job satisfaction of nurses? (2) What do nurses consider as components of their job satisfaction? A tape recorder and paper-pencil were used for data collection. Six clinical nurse experts were interviewed until the interview data reached a saturation of responses. The content analysis method was used to analyze the data. Eight constructs were confirmed through the interview. In the component of "individual growth and promotion", two items were generated from interviewed data that reflected nurses' equity perception. In the component of "salary and fringe benefits", one item was generated from interviewed data that reflected nurses' equity perception. In the component of "work conditions", "administration", and "family and work balance"; one item, three items, and one item were added, respectively. These items represented completely new

nurses' desired needs.

Through a combination of literature reviews and the interviewed data, eight dimensions with 45 items were initially established, including promotion and individual growth (5 items), responsibility and control (6 items), recognition (6 items), work conditions (6 items), salary and fringe benefits (7 items), interaction (5 items), administration (6 items), and family and work balance (4 items). All of these dimensions reflected the attributes of fulfillment of desired needs within the work setting and happiness or gratifying emotional responses towards working conditions, based on Herzberg's Two Factor Theory (Herzberg, 1959). The dimensions of "work conditions", "salary and fringe benefits", "interaction", "administration", and "family and work balance" are related to Hygiene factors. Hygiene factors are extrinsic to the job and part of the job environment. Unsatisfied hygiene factors result in dissatisfaction. The improvement of these factors can provide the stable work environment in order to reduce nurses' absences, resignations, or grievances. The dimensions of "promotion and individual growth", "recognition", and "responsibility and control" are related to motivation factors. Motivation factors are intrinsic factors, which result in nurses feel satisfied with their work. In addition, "promotion and individual growth", "recognition", "responsibility and control", "salary and fringe benefits" dimensions reflected the attribute of perceived job equity and expectancy of job value, which based on Adams's Equity Theory (Adams & Bond, 2000) and Vroom's Expectancy Theory (Vroom, 1964). The items in each dimension were written in a homogeneous way to reflect the latent variables underlying them. Each item was written in a clear and simple sentence, explaining only one idea, and avoiding double negatives.

The CNJSS was developed in the Chinese language. Based on the format of reviewed nurses' job satisfaction scales (IWS, MMSS, and TNJSS), a five-point Likert scale was determined for the CNJSS with the scores ranging from 1 = fully dissatisfied to 5 = fully satisfied. Each item is written in a positive way.

2.1.2 Phase II: Content validation of the initial CNJSS

Five experts evaluated the content validity of initial CNJSS. One was formerly the dean of a school of nursing. Another expert came from nursing school and was formerly a hospital nurse division vice director. Two others came from hospitals and had experience as nursing division directors. The final expert was a hospital employee who worked as a head nurse. Three of these owned professional titles as professors and two of them held associate professor titles. Furthermore, one of them has a PhD in nursing administration. One was a doctoral candidate in nursing administration and three have master's degrees. The item Content Validity Index (I-CVI) ranged from .8 to 1.0. The scale Content Validity Index of Average (S-CVI) was .97.

2.1.3 Phase III: A pilot testing of the initial CNJSS

The construct validity of the initial CNJSS was tested by the exploratory factor analysis (EFA) in this phase. In addition, the internal consistency reliability of Cronbach's alpha was tested. DeVellis (2012) classified a sample of 300 as good to test the instrument construct validity. This rule of thumb was used to select 300 participants from the Chinese tertiary general hospital. The inclusion criteria of participants' selection were as staff nurses with Chinese RN licenses; nurses who worked at the Chinese hospital for at least three months after passing a period of probation; nurses who provided direct nursing care in inpatient departments; and nurses were willing to participate in the study. Considering the attrition of subjects, 10% of the sample size was added. After the proportional stratified random sampling, 331 RNs from six departments were selected.

2.1.4 Phase IV: Psychometric testing of the final CNJSS

The confirmatory factor analysis (CFA) was used in this phase to confirm the construct validity of the final CNJSS. The overall scale reliability was determined by the internal consistency reliability of Cronbach's alpha. Each dimension's reliability was tested by the construct reliability. The probability sampling of a multi-stage random sampling method was used to select nurses from four regional tertiary general hospitals, which represent the northwest, northeast, southwest and south central. In each hospital, the proportional stratified random sampling was conducted to select nurses from six inpatient departments. The inclusion criteria of these participants were the same as the criteria used for the EFA in Phase III. According to suggestions made by Hair *et al.* (2010, p. 662), when the number of constructs are large, a minimum sample size of 500 participants is required. Thus, at least 500 RNs were needed due to the fact that nurses' job satisfaction was a multidimensional construct with seven dimensions. In addition, 10% of subjects were added in order to prevent the attrition of subjects during data collection. Therefore, 550 RNs were selected to test the measurement model of nurses' job satisfaction. A total of 566 RNs were recruited for this study after the proportional stratified random sampling calculation.

2.2 Data analyses

Statistical Package of IBM SPSS for Windows Version 22.0 was used to enter and analyze data. The significance level of this study was set up as .05. This researcher screened all the data before data analysis.

2.2.1 Demographic data

Descriptive statistics was used for reporting demographic and study variables. Frequencies (f) and Percentages were used for reporting categorical variables. Means (M) and

Standard Deviations (SD) were used for reporting continuous variables.

2.2.2 Reliability analysis

In phase III and phase IV, the Cronbach's alpha was used to test internal consistency reliability of the CNJSS. Nunnally (1978) stated that the Cronbach's alpha should be more than .7 as the minimum criteria for a newly-developed instrument. In addition, in phase IV, the construct reliability was tested for each dimension. According to Diamantopoulos and Siguaw (2000), it is recommended that construct reliability of more than .6 is desirable.

2.2.3 Construct validity analysis

In phase III, EFA was used to test the CNJSS construct validity. Principal factors extraction method was selected with the assumption that factors resulting from factor analysis were based only on the common variance (Hair *et al.*, 2010). Oblique rotation was selected, because it seems to be more reasonable on the face of item pattern than orthogonal rotation with the assumption that factors are correlated (Tabachnick & Fidel, 2013). The eigenvalue of each factor was greater than 1 and reached 60% of the variance considered as enough factors. In addition, the item factor loading more than .35 met the minimal level for interpretation of structure, when sample size are more than 250 participants. The scree plot could also illustrate the number of extracted factors in this study (Hair *et al.*, 2010).

In phase IV, before conducting CFA, the normality was tested by skewness and kurtosis. The linearity was tested by the scatterplot matrix. Moreover, the multicollinearity was tested by the correlation of observed variables. Using the LISREL 8.72 for Windows program, the seven factors model of nurses' job satisfaction constructs were tested by second-order CFA. According to Hair *et al.* (2010), the criteria for model fit of measurement model with the empirical data were $p\text{-value} \geq .05$; Chi-square (χ^2)/ degree of freedom (df) < 2.00; Comparative Fit Index (CFI), Goodness of Fit Index (GFI), and Adjust Goodness of Fit Index (AGFI) > .90; Root Mean Square Error of Approximation (RMSEA) < .08; and Standardized Root Mean Square Residual (SRMR) < .07. In addition, the construct validity's factor loading of more than .3 was acceptable for a sample size of more than 350 participants as recommended by Hair *et al.* (2010). In this study, since the sample size was 510 participants, the cut-off factor loading was set up as .3. T-value of each item more than 1.96 ($\alpha = .05$) indicated significantly related to the latent constructs (Hair *et al.*, 2010).

2.3 Ethical considerations

The Ethical Review Committee for Research Involving Human Research Subjects, Health Sciences Group of researcher affiliation (ECCU) approved this research as part

of large project "Factors Influencing Nurse-Assessed Quality of Nursing Care in Chinese Hospitals" (No.098.1/57).

2.4 Data collection

After receiving approval from ECCU and permission from the hospitals to collect data, the following steps were carried out: (1) The PI obtained the number of nurses from each stratum inpatient department and total number of nurses from each hospitals. (2) The PI trained research assistants in the sampling techniques and in the participants' selection criteria of data collection. (3) The research assistants and the PI gave the informed consent form, the information sheet, and questionnaires to participants. (4) The research assistants and the PI collected questionnaires from selected participants. (5) The PI examined the completeness of the questionnaires.

3. Results and Discussion

3.1 Results

3.1.1 Demographic data

In phase III, the three hundred and two participants returned questionnaires suitable for data analysis. The response rate was 91.2%. The participants' ages ranged from 21 to 52 years old (Mean = 28.1, SD = 5.3). The percentage of participants' age, gender, education, work experience, employment status, and work unit are presented in Table 1.

In phase IV, fifty-six out of 566 questionnaires were declined or not completed. Therefore, a total of 510 questionnaires were received. The response rate was 90.11%. The age of participants ranged from 21 to 54 (Mean = 31.2, SD = 6.3). The percentage of participants' demographic characteristics were showed in Table 1.

3.1.2 Reliability testing

In phase III, the 36-item's CNJSS total Cronbach's alpha coefficient of internal consistency reliability was .95. The seven sub-scale Cronbach's alpha coefficients ranged from .83 to .93. In phase IV, 34-item's CNJSS overall Cronbach's alpha coefficient was .93. The construct reliability in each dimension ranged from .61 to .91.

3.1.3 Validity testing

In phase III, the results showed that seven factors with 36 items were extracted, including administration (5 items), recognition and responsibility (11 items), promotion and individual growth (5 items), salary and fringe benefits (6 items), family and work balance (3 items), work conditions (3 items), and interaction (3 items). Seven factors' eigenvalues ranged from 1.02 to 14.19, which together accounted for 71.47% of the variance. The items' factor loading ranged from .37 to 1.04. The scree plot also illustrated the seven factors in this

study.

In phase IV, the second-order CFA was used to determine the construct validity of the CNJSS. The estimation method of Robust Maximum Likelihood was used due to the data violating the normality assumption. In the initial CFA model of the CNJSS, the complete standardized factor loading of item 6 was 1.02, which is not acceptable (Diamantopoulos & Siguaw, 2000). Thus, the item 6 was deleted. Then, the CFA of CNJSS was run again. This time, the results showed that the complete standardized factor loading of item 11 was .23, which is lower than the value of .3 as suggested by Hair *et al.* (2010). Thus, the item 11 was deleted. The CFA of CNJSS was run again.

The result of the modified CNJSS determined 7 latent constructs with 34 items (Figure 1). As shown in Table 2, the model fit statistics were acceptable ($\chi^2 = 433.70$, p-value = .07, df = 391, GFI = .95, RMSEA = .02, AGFI = .93, and CFI = 1.00). The items' statistic reports of complete standardized factor loading (B), unstandardized factor loading (b), t-value (t), standard error (SE), squared multiple correlation (R^2), and construct reliability (CR) are presented in Table 3. The t-value of each observed variable ranged from 8.56 to 21.27 ($\alpha = .05$).

3.2 Discussion and limitation

This study was aimed to develop and test the psychometric properties of the CNJSS, which is proposed to measure contemporary Chinese nurses' job satisfaction. The strength of this study was the development of the CNJSS based on the theoretical definition of nurses' job satisfaction, which was generated from concept analysis. In addition, the CNJSS advanced from a combination of both the content and process motivation theories of Vroom's Expectancy Theory, Adams's Equity Theory, and Herzberg's Two Factor Theory to investigate the contemporary nurses' job satisfaction among Chinese RNs. At the initial step, the PI developed the constructs of the CNJSS based on both literature review and the interview of clinical experts. The theoretical underpinning of all constructs were based on Herzberg's Two Factor Theory. The constructs of "salary and fringe benefits", "promotion and individual growth", and "recognition and responsibility" were specific to Adams's Equity Theory, which measured the nurses' perception of comparing the equity of payment and career development to others in their organizations. In addition, nurses recognized by others also make them feel the balance between their work effects and results of their work. The constructs of "recognition and responsibility", "salary and fringe benefits", and "promotion and individual growth" were also specific to Vroom's Expectancy Theory, which revealed nurses' feelings of their expectancy of valuable nursing work. Additionally, the items generation of the CNJSS reflected contemporary nurses' consideration of their feelings as a response to their clinical work in different areas of China.

The results of Phase III revealed evidence of the adequate internal consistency as the total Cronbach's alpha coefficient was .95, which met the minimum criteria for a

Table 1. Demographic characteristics of participants

Characteristics	Phase III (n = 302)		Phase IV (n = 510)	
	Frequency	Percentage	Frequency	Percentage
Age (years)				
20-29	216	71.5	260	51.0
30-39	71	23.5	187	36.7
40-49	13	4.3	59	11.5
≥ 50	2	0.7	4	0.8
Gender				
Male	0	0.0	4	0.8
Female	302	100.0	506	99.2
Education				
Secondary technical	33	10.9	27	5.3
Associate degree	119	39.4	156	30.6
Bachelor degree	150	49.7	321	62.9
Master degree	0	0.0	6	1.2
Work experience				
< 5 years	186	61.6	197	38.6
5-10 years	69	22.8	162	31.8
11-15 years	20	6.6	51	10.0
16-20 years	21	7.0	48	9.4
20-25 years	6	2.0	41	8.0
26-30 years	0	0.0	9	1.8
> 30 years	0	0.0	2	0.4
Employment status				
Permanent	59	19.5	122	23.9
Contract	243	80.5	388	76.1
Work departments				
Surgical	101	33.5	157	30.8
Medical	154	51.0	187	36.7
OBGYN	11	3.6	40	7.8
Pediatric	14	4.6	24	4.7
ICU	16	5.3	80	15.7
EENT	6	2.0	22	4.3

OBGYN = gynecology and obstetrics department, EENT = eye, ear, nose, and throat department, ICU = intensive care unit

Phase III refers to a pilot testing of the initial Chinese Nurse Job Satisfaction Scale (CNJSS) through exploratory factor analysis

Phase IV refers to the psychometric testing of the final CNJSS through confirmatory factor analysis

newly-developed instrument, as the Cronbach's alpha coefficient should be more than .7 (Nunnally, 1978). The seven dimensions of Cronbach's alpha coefficients ranged from .83 to .93, which is acceptable for subscale Cronbach's alpha coefficient of more than .7, as suggested by Polit *et al.* (2012). In Phase IV, the total Cronbach's alpha coefficient was .93, which is acceptable as well (Nunnally, 1978). The construct reliability of each dimensions ranged from .61 to .91, which met the minimum criteria of more than .60, as suggested by

Diamantopoulos and Siguaw (2000).

The construct validity of this study was tested by the EFA and confirmed by the CFA. The results of factor analysis in Phase III provided the acceptable evidence for extracting the seven factors of the initial CNJSS. According to Hair *et al.* (2010), the eigenvalue of each CNJSS's factor was greater than 1 and explained 71.47% of the total variance, which reached 60% variance and was considered as sufficient factors. In addition, the item factor loading ranged from .37 to

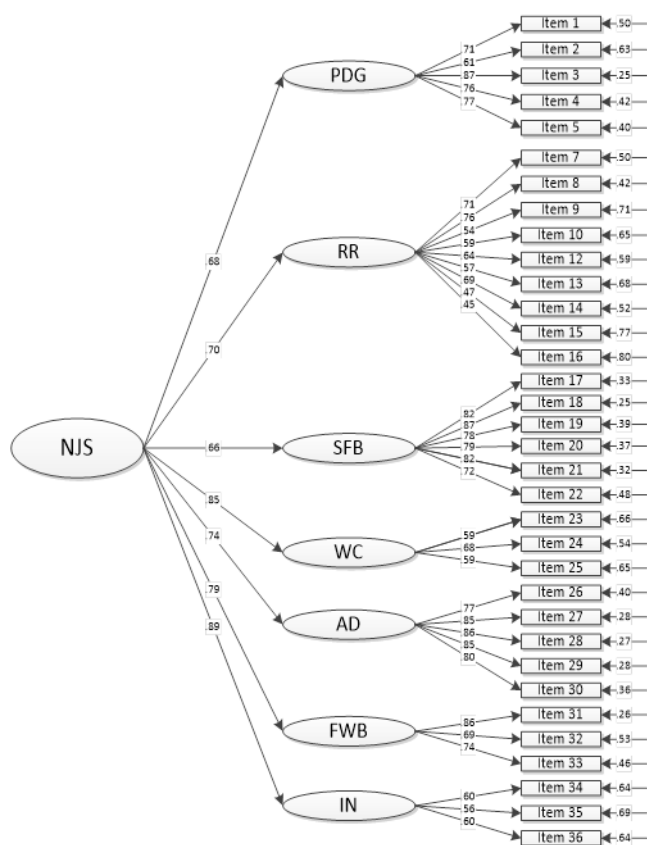


Figure 1. The standardized estimates of confirmatory factor analysis (CFA) model for Chinese Nurse Job Satisfaction Scale (CNJSS). NJS, nurse job satisfaction; PDG, promotion and individual growth; RR, recognition and responsibility; SFB, Salary and fringe benefits; WC, work conditions; AD, administration; FWB, family and work balance; IN, interaction.

1.04, which met the minimal level of 0.35 for interpretation of structure. Moreover, in each factor, at least three items have been extracted. These results provided sufficient evidence of good construct validity through the EFA. In phase IV, the results of the initial CNJSS hypothesized model revealed that factor loading of item 6, “supervisor recognized my work”, was more than 1, which means that this item was redundant with other items (Diamantopoulos & Siguaw, 2000). This may be resulted from the fact that nurses consider “supervisor recognition” be broadly included in “colleague recognition”. The first time modified model explained that item 11, “nurses’ responsibility to patient outcomes”, received lower than .30 of factor loading, which is not acceptable as suggested by Hair *et al.* (2010). This may be due to the thinking that “patient outcomes” depend not only on nursing care but also on co-workers effects, such as doctors, technicians, psychologists, or nutritionists. The final modified model get the goodness fit of p-value of more than .05 and acceptable modified model’s indicators as suggested by Hair *et al.* (2010). Discussions of the constructs of the seven dimensions are as follows.

“Recognition and responsibility” refers to Chinese nurses’ positive feeling pertaining to the acceptance of the result of their work by themselves, patients or patients’ family members, colleagues, and society. In the previous studies, the recognition and the responsibility were separated into two dimensions (Mueller & McCloskey, 1990; Cao, 1998). However, in the current hospital setting, nurses’ acceptance of their work by themselves and others are combined together into one dimension through both the EFA and CFA reports. This dimension could illustrate how nurses perceived the balance between their work efforts and their recognitions. This dimension could also reflect how nurses valued their recognitions and responsibilities.

Table 2. Measurement model of Chinese Nurse Job Satisfaction Scale (CNJSS) (N = 510)

Relative Fit Index	Goodness of Fit Statistics	Hypothesized model		Modified model	
		statistic	Relative fit	statistic	Relative fit
χ^2 – test	$P \geq .05$	2388.16 ($p = .00$)	No	433.70 ($P = .07$)	Yes
df		520		391	
χ^2/df	< 2.00	4.59	No	1.11	Yes
CFI	> .90	.95	Yes	1.00	Yes
AGFI	> .80	.75	No	.93	Yes
GFI	> .90	.78	No	.95	Yes
NFI	> .90	.93	Yes	.99	Yes
SRMR	< .07	.08	No	.05	Yes
RMSEA	< .08	.08	No	.02	Yes

χ^2 = Chi-square, df = degree of freedom, CFI = Comparative Fit Index, AGFI = Adjust Goodness of Fit Index, GFI = Goodness of Fit Index, NFI = normed fit index, SRMR = Standardized Root Mean Square Residual, and RMSEA = Root Mean Square Error of Approximation.

Table 3. The Confirmatory factor analysis of Chinese Nurse Job Satisfaction Scale (N = 510)

Latent constructs	b	B	SE	t	R ²	CR
1. Promotion and individual growth	0.45	0.68	0.04	12.69	0.46	.86
Item 1 Equitable to take part in professional training	1.00	0.71			0.50	
Item 2 Taking an examination to get a permanent position	1.12	0.61	0.09	13.12	0.37	
Item 3 Equitable opportunity for promotion	1.33	0.87	0.07	17.80	0.75	
Item 4 Continuing education	1.02	0.76	0.06	16.47	0.58	
Item 5 Participation in research	1.04	0.77	0.07	15.34	0.60	
2. Recognition and responsibility	0.31	0.70	0.03	12.15	0.48	.84
Item 7 Colleagues recognize	1.00	0.71			0.50	
Item 8 Other co-workers recognize	1.07	0.76	0.06	19.26	0.58	
Item 9 Patients or patients' family members recognize	0.78	0.54	0.07	11.72	0.29	
Item 10 Society recognizes	1.16	0.59	0.10	11.42	0.35	
Item 12 Responsibility for my work	0.94	0.64	0.09	10.77	0.41	
Item 13 Ability to control the working conditions	0.76	0.57	0.07	10.44	0.32	
Item 14 Position allows me to work within ability	1.05	0.69	0.09	11.95	0.48	
Item 15 Ability to solve problems from my work	0.66	0.47	0.07	9.16	0.23	
Item 16 Ability to undertake challenging work	0.64	0.45	0.07	8.56	0.20	
3. Salary and fringe benefits	0.60	0.66	0.04	13.77	0.44	.87
Item 17 Current salary	1.00	0.82			0.67	
Item 18 Overtime pay for working on a holiday	1.00	0.87	0.05	21.27	0.75	
Item 19 Pay for night shift	1.01	0.78	0.05	19.02	0.61	
Item 20 Fringe benefits (housing, insurance, and holiday)	0.91	0.79	0.05	20.10	0.63	
Item 21 Increasing rate of salary per year	0.97	0.82	0.05	20.21	0.68	
Item 22 Equity of payment	0.99	0.72	0.06	16.64	0.52	
4. Work conditions	0.40	0.85	0.04	11.27	0.72	.65
Item 23 Working time per day	1.00	0.59			0.34	
Item 24 The overtime condition	1.32	0.68	0.10	13.25	0.46	
Item 25 The space for resting	1.31	0.59	0.14	9.15	0.35	
5. Administration	0.38	0.74	0.03	14.57	0.55	.91
Item 26 Strategy makes nurses work together well	1.00	0.77			0.60	
Item 27 Managers solve difficulties in my actual life	1.29	0.85	0.07	19.56	0.72	
Item 28 Managers consider my point of view	1.40	0.86	0.07	20.34	0.73	
Item 29 Managers give consolation and coordination	1.37	0.85	0.07	19.53	0.72	
Item 30 Communication manner	1.13	0.80	0.06	18.58	0.64	
6. Family and work balance	0.63	0.79	0.04	15.90	0.62	.81
Item 31 Balance of family need and work need	1.00	0.86			0.74	
Item 32 Opportunity to take care of sick family members	1.01	0.69	0.08	13.01	0.47	
Item 33 Have time to take care of family members	1.00	0.74	0.07	13.39	0.54	
7. Interaction	0.37	0.89	0.03	12.16	0.79	.61
Item 34 Teamwork and cooperation between nurses	1.00	0.60			0.36	
Item 35 Cooperation with other medical staff	1.28	0.56	0.14	9.18	0.31	
Item 36 Needs are considered by the head nurse	0.95	0.60	0.10	9.73	0.36	

“Promotion and individual” growth refers to Chinese nurses’ positive feeling pertaining to their in-service training, personal promotion, participation in research, and equality or opportunity of career development. This instrument added the unique contents for equity. The items of “equitable to take part in professional training” and “equitable opportunity for promotion” reflected that nurses appreciated the equitable professional development in their working settings. Although this dimension was also mentioned by researchers Cao

(1998) and Yang *et al.* (2012), they did not mention the perception of nurses’ equity comparing to others.

“Work conditions” refers to Chinese nurses’ positive feeling about their work hours and job environments. This dimension was also mentioned by Cao (1998) and Hu (2007). It could be seen as a traditional component of Chinese nurses’ job satisfaction. However, this instrument added the new desired needs of “space for resting”.

“Salary and fringe benefits” refers to Chinese nurses’

positive feeling towards their fringe benefits, salary, projected increase of their salary, and the equality of pay between permanent and contract nurses. This dimension was also mentioned by several researchers, such as Stamps and Piedmonte (1986) and Sriratanaprat *et al.* (2012). However, these researchers did not consider the equality of pay among nurses with different employment statuses. Furthermore, this dimension received the lowest score among the seven components, which indicated that most nurses feel their salaries are lower compared with other occupations. In addition, most Chinese nurses do not have annual vacations due to their busy clinical work. Therefore, hospital managers should consider increasing nurses' salary. The opportunity for nurses taking vacation should be considered in order to make nurses satisfied with their jobs.

"Administration" refers to Chinese nurses' positive feeling toward their managers' leadership style. This dimension was also mentioned by other researchers, such as Moutzoglou (2010) and Sriratanaprat *et al.* (2012). However, it was inconsistent with the previous Chinese nurses' job satisfaction instrument (Cao, 1998). The interview with clinical experts resulted in three items added for the nursing managers: considering nurses' opinions, solving nurses' difficulties, and making nurses work together. This dimension received the highest mean score among seven components, which indicated that Chinese nurse managers had considered that leadership style does contribute to nurses' job satisfaction.

"Family and work balance" refers to Chinese nurses' positive feeling pertaining to the balance between work and family life. This dimension was also mentioned by other researchers, such as Cao (1998) and Mrayyan (2006). However, this dimension received the second lowest mean score among the seven components, which showed the difficulty in balancing family and work among Chinese RNs. Therefore, nurse managers should consider putting into place new initiatives in order to help nurses overcome this imbalance.

"Interaction" refers to Chinese nurses' positive feeling about the interpersonal contact with nurses, coworkers, and nurse managers during working hours. This dimension was also mentioned by Mrayyan (2006) and Moutzoglou (2010). It was generally considered as a traditional component of job satisfaction among the nursing population.

However, the subjects' population of this study was in-patient departments' nurses. The outpatient departments' nurses were not included in this study. This may be considered as a limitation to the generalization of the findings of this study to the whole hospital settings.

4. Conclusions and Implications

The development of the CNJSS was based on both process and content motivation theories. According to Herzberg's Two Factor Theory, the dimensions of CNJSS included both the hygiene factors ("work conditions", "salary and fringe benefits", "administration", "family and

work balance", and "interaction") and the motivation factors ("recognition and responsibility" and "promotion and individual"). The dimensions related to motivation factors are also associated with Adams's Equity Theory and Vroom's Expectancy Theory. Although the dimension of "salary and fringe benefits" is related to hygiene factors, it is associated with Adams's Equity Theory and Vroom's Expectancy Theory as well. This is because "salary and fringe benefits" can reflect nurses' expectancy of job value and perception of job equity. Thus, the results illustrated that the CNJSS was a valid and reliable scale to assess nurses' job satisfaction under the current healthcare system at nationwide Chinese tertiary general hospitals.

Hospital managers can use this instrument to assess nurses' job satisfaction under the current healthcare system to find problems. Based on the results of the nurses' job satisfaction assessment, the good policy makers should further consider how to make nurses feel satisfied with dimensions related to hygiene factors in order to reduce the absences, resignations, or grievances. In addition, regarding dimensions related to motivation factors, policy makers should consider how to motivate nurses to give an effective performance in work settings. This is because nurses' effective performance can help prevent adverse patient situations and further increase patients' health.

Moreover, although the dimension of "salary and fringe benefits" is related to the hygiene factor of Herzberg's Two Factor Theory, the effective hospital managers should pay attention to change this hygiene factor into motivation factor lead to mobilize the enthusiasm of nurses. Meanwhile the "salary and fringe benefits" is related to Adams's Equity Theory and Vroom's Expectancy Theory. Thus, hospital managers should consider what are value of nurses' expectancies and nurses' perception of equity in order to increase nurses' good performance.

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