CHAPTER 4

RESULTS

The findings of each step of the study are presented sequentially in this chapter. The first phase (step 1 to step 5) is the initial development of the professional values scale (PVS) for registered nurse. The second phase (step 6 and step 7) is the psychometric testing of the PVS.

Phase I: Instrument Development

Step 1: Results of concept definition and framework formation

Based on a comprehensive literature review of the concept of professional values in the nursing discipline, the theoretical definition of professional values was defined as beliefs about how nurses should serve the people, which are chosen voluntarily, espoused publicly and acted upon consistently. They are endorsed by nursing professionals and reflected in the standards or guidelines of professional practice.

Individual interviews and focus groups were also conducted with 29 Chinese nurse experts to explore their understandings of the meaning of professional values, and the essential professional values they believed Chinese nurses should hold. The participants included 10 senior clinical nurses, 10 nurse educators, and nine nurse administrators in nursing service. Of the nurse administrators, three were (associate)

directors of nursing departments and six were head nurses. All of the participants were female. They had expertise in medical-surgical nursing, pediatrics, nursing administration, nursing education, and/or nursing ethics in hospitals or nursing schools. Table 3 displays the demographic characteristics of these participants.

The narrative data provided by participants revealed their understandings about the meaning of professional values. Basically, all participants agreed that professional nursing values are beliefs which guide nurses' choices in their professional practice. The seven themes of professional values identified were altruism, autonomy, caring, human dignity, justice, promote the development of the profession, and trustworthiness. Each theme is presented as follow.

Altruism

Nurses understood altruism as concern about the benefit and well-being of others, even at some cost, if necessary.

The participants advocated the spirit of self-sacrifice. Some explained that, when nurses' interests are in conflict with their patients, nurses should spend more time and effort on behalf of them:

"In order to explain something clearly to patients, she [a senior nurse] might get off work at 6 or 7 PM, or even 8 or 9 PM, though she can go home at 5 PM." (Participant 19)

Some participants thought nurses should endeavor to ensure patients' enhanced

Table 3

Demographic Characteristics of the Interview Participants

Category	Nurse educator (n=10)	Senior clinical nurse (n=10)	Nurse administrator (n=9)
Age (year)	43.67±5.78 (38-53)	30.50±4.06 (24-36)	37.44±5.55 (29-46)
Working experience (year)	21.89±7.36 (14-35)	10.70±4.74 (3-17)	15.78±6.50 (6-24)
Educational level			
Associate degree	1	9	3
Bachelor degree	3	1	3
Master degree	3	-	3
Doctoral degree	3	-	-
Professional title			
Lecturer or senior nurse	-	8	1
Assistant professor or chief nurse	-	2	5
Associate professor or vice-nurse consultant	8	-	3
Professor or nurse consultant	2	-	-

outcomes and maximum benefits.

"…so in the end (of an i.v.) we will wait (until the treatment fluid is all infused into patients' blood), not waste a drop of it…" (Participant 17)

Concerning about colleagues' difficulties and helping each other at work were also proposed.

"Supporting colleagues is another kind of altruism…if some colleagues have difficulties, we need to help finish their work." (Participant 4)

Autonomy

Nurses recognized autonomy as honoring patients' rights to make decisions about their health care.

Participants believed that if patients are conscious adults, nurses should provide enough information within professional boundaries to enable patients and their families to make decisions about their condition.

"Except for telling him how to do, you need to explain clearly, to make sure he understands… Evaluate if he fully understands first, and then let the patient make a choice, to see if he recognizes or agrees" (Participant 1)

However, a few participants, especially the clinical nurses, disagreed with "absolute" autonomy. They contended that some patients might lack the cool head for a wise judgment, thus compromising or endangering their health:

If it [patient's decision] will affect medical treatment, I don't think we should fully support their autonomy… Some decisions might make them lose the best time for treatments.

Some participants supported nurses should plan care in partnership with patients.

"Love can be embodied when you consider patients' situations and make choices with them together." (Participant 14)

As to malignant diagnosis disclosure, many participants were inclined to be conservative, especially for older patients whom they perceived could not withstand this blow. They considered it as "a goodwill lie".

I think patients have the right to know their real health status… But in China, there are many family members, especially those of old patients, don't want them (old patients) know (malignant diagnosis)… It might be acceptable for me. But in terms of young patients, 30s or 40s (years old), I think they should be informed (of malignant diagnosis). (Participant 4)

Caring

Participants stated that nurses appreciated caring as the willingness and knowledge to explore patients' needs in a timely manner and to integrate concern and warmth into compassionate and individualized nursing care.

Nurses must be very attentive in observing and listening to patients in order to

detect and meet their needs for care. One participant gave an example of a senior nurse who could do much better than the junior nurses when caring for patients having an i.v. infusion:

> *"In fact, she doesn't do very big things besides [the] infusion; e.g. she might simply make the quilt comfortable for a patient. Trifles as these are, she is willing to do so sincerely for the purpose of caring for patients."* (Participant 17)

Many of the participants highlighted nurses' empathy to patients:

> *"Without the idea of empathy, being able to think in the place of patients, I think it is very difficult for a healthy person to understand patients' sufferings."* (Participant 2)

Some of the participants emphasized emotional interaction with patients via non-verbal communication, such as holding hands, making eye contact, and smiling:

> *"A patient told me that he was very depressed when admitted into hospital. But, he said 'I feel much relaxed every time I see your smile.' You see, how effective a smile can be!"* (Participant 8)

Human dignity

Nurses express human dignity by accepting people as worthy of esteem and reverence.

Nearly all the participants mentioned safeguarding patients' privacy and confidentiality. For example, nurses should take measures to shield patients' intimate parts from being exposed to others when providing care. Nurses should help patients to keep the secrets that they do not want to be made public:

> *"With a colostomy stoma, some patients don't want others to know [they have it], including their roommates, or even more people. As health-care professionals, we will surely help them to conceal this secret."* (Participant 7)

Showing respect to patients also was considered to be important by many participants, such as to address patients in their preferred way, to avoid sneering at patients' health problems, and to communicate with others in a dignified manner. Besides conscious patients, they also mentioned those unconscious or at the end of their lives:

> *"Sometimes, patients' families have given up on patients' living. But, as nurses, we would also take care of them with respect, as if they are conscious or normal."* (Participant 18)

Justice

Nurses uphold justice by observing moral and legal principles for individuals and groups to ensure they receive equal treatment and impartial welfare.

Nearly all of the participants expressed beliefs in delivering equivalent service to patients of diverse creeds, cultures, genders, and economic status.

"We should treat patients equally, no matter if they are rich or poor, high or low, well-educated or not." (Participant 26)

Participants also advocated that nurses should acknowledge improving public health as a responsibility. Some mentioned that nurses should promote universal access to health care by research, sending services to underserved areas, and being involved in policy-making:

"We used to conduct research to call on accessible services for the elderly in a community. At that time, their average income was only 4×× Renminbi Yuan per month, but we revealed that those services cost at least 5×× Renminbi Yuan or even more. Then, it is our responsibility to appeal to society for the elderly." (Participant 24)

Promote the development of the profession

Promote the development of the profession was described as nurses share the tasks required for such advancement.

Most participants stressed the importance of updating nurses' "intellectual capital" by lifelong learning.

"The nurse themselves need to update their nursing knowledge… it means to be in line with the development of the profession, make themselves adapt to this evolvement, no matter in their thinking, vision, or professional knowledge and skills." (Participant 5)

Some participants emphasized participation in research to contribute to evidence-based professional knowledge.

"Nursing, especially nursing, has many things that are on the process of development…Therefore, I think the scientific rigorous attitude and research need to be improved. Thus our profession may have a better development." (Participant 1)

Some talked about improving intradisciplinary and interdisciplinary cooperation and team spirit in nurses' work:

"[The] nursing profession is not standing lonely in the hospital or the environment. You should have compatibility with other disciplines or should have belief in cooperation and communication." (Participant 29)

A few participants pointed out the significance of upholding a professional image in order to obtain societal prestige and support for the nursing profession.

"If every one of us does very well at work, the overall public evaluation of the nursing profession will be enhanced. This is a way to advance the nursing profession." (Participant 11)

Trustworthiness

Nurses obtain trustworthiness, credibility, and patients' confidence by honest and legitimate efforts to fulfill their obligations.

Nearly all participants assented to ethical and legal responsibility and accountability for their remarks and practices as the means for earning basic trust.

"Nurses are responsible to gather all the abnormal signs of patient. I need to report them to physicians. This is my duty as a nurse. I must fulfill it." (Participant 9)

Nurses should be honest and should keep their promises to patients:

"Once we assure patients that we will do something, we will surely go to check and inquire about it and then tell them the results…" (Participant 20)

After analyzing the findings of the interviews, and validating them with the ICN code (2006), the CNA code (2008) and the literature, the seven themes proposed by participants were considered as the most essential components in professional values for Chinese registered nurses. These components were used as the dimensions of the conceptual framework of this study. The definitions of each dimension are operationalized and presented in Table 4.

Table 4

Dimensions and Definitions of Professional Values

Dimension	Definition
Altruism	Concerning for the welfare and well-being of patients and colleagues without consideration of rewards. It is characterized by devotion, benefiting patients, and supporting colleagues.
Autonomy	Appreciating patients' rights to make decisions about their own health care. It is characterized by sharing information, collaborative planning, and self-determination.
Caring	Integrating concern and warmth into compassionate, sensitive and appropriate care of patients. It is characterized by active caregiving, empathy and emotional interaction.
Human Dignity	Attaching importance to the inherent worth and uniqueness of patients' status by protecting their rights. It is characterized by preservation of privacy and confidentiality, and respect for the person.
Justice	Upholding moral and legal principles of equity to help individuals and groups receive fair treatment, impartial health services and resources. It is characterized by non-discriminate service and universal access to health care.
Promote the development of the profession ("Professional")	Assuming responsibility for advancement of the nursing profession. It is characterized by continued professional development, cooperation, participation in research, and upholding professional image.
Trustworthiness	Deserving credibility and confidence by honest and legitimate efforts to meet nursing obligations. It is characterized by accountability, keeping promises and *Shen Du (i.e., being self-disciplined and doing things ethically even when not being supervised)*.

Step 2: Results of item pool generation

The first draft of the item pool included 215 English items. According to the dissertation advisory committee's suggestions, items were revised to avoid ambiguity and similarity, two or more ideas in one statement, or more than 20 words in one statement. Items considered irrelevant or overlap with other items were deleted. This process left 125 items, with 17 items in Altruism dimension, 15 items in Autonomy dimension, 16 items in Caring dimension, 17 items in Human Dignity dimension, 17 items in Justice dimension, 23 items in Professional dimension, and 20 items in Trustworthiness dimension.

Then the second draft item pool with 125 items was reviewed again. After iterative reviews and discussions, 24 items were deleted because they were similar to other items, or too sensitive or unsuitable in the Chinese nursing society. The expression of some items was reworded to make them more colloquial and understandable. At the end of this step, the item pool was composed of 101 items (see Appendix I).

Step 3: Results of instrument format determination

A five-point Likert-type scale format was employed in this scale. The response categories ranged from not important to most important (0=not important, 1=slightly important, 2=important, 3=very important, 4=most important).

Originally, the response format was determined to measure the degree of importance of each value statement to nurses. However, though four out of the six

experts for content validation agreed with this idea, two suggested that in order to measure if the nurses have these values, the scale responses choices should be the frequencies of nurses' performances. The researcher related this concern to the other four nurse experts, and they reiterated supports for the original response format. Their rationales were that first, not all phenomena or situations described in the items would happen frequently or would be encountered by every nurse with equal frequencies, such as participation in health services in emergencies or disasters. Secondly, though a person's beliefs could guide people's behavior, they were not always the only determinant of a specific behavior.

At the same time, the researcher reexamined the concept analysis and definition of professional values in this study, and again reviewed the literature. In this study, professional values were defined as a belief rather than a behavior. Though a persistent behavior was an attribute of the values, they were not equivalent. Furthermore, the findings of the literature review showed that all existing studies chose a Liker-type scale to measure professional values. Most instruments ask respondents to rate their perceptions of the importance of each value statement (Eddy, 1989; Lui, et al., 2008; Ochsner, 1996; Rassin, 2008; Weis & Schank, 2000), with some measuring the degree of agreement (Thurston, et al., 1989), and some requiring prioritization of values (Altun, 2002; Rassin, 2008). In addition, as indicated by Spector (1992), frequency response choices are commonly used to measure personality or characteristics of environments in scales, and respondents are asked to

indicate how often they have engaged in certain behaviors or certain events.

Considering the aforementioned aspects, after discussion with the advisory committee, the response choices remained a rating of the perception of importance of each value. Additionally, one expert suggested the instruction for filling out the scale begin with “These are descriptions about nurses’ recognition and understanding of nursing profession, and their performances when serving the patients.” The revision was made accordingly.

Step 4: Results of content validity by experts

An item pool package with 101 items and seven dimensions was reviewed by a panel of six content validity experts.

The inter-rater agreements of each pair of the experts ranged from .81 to .95. The I-CVIs of all items ranged from .33 to 1.0. If an item’s I-CVI was more than .78 (Polit, Beck, & Owen, 2007), i.e., at least five or six experts choose “3=quite relevant” or “4=very relevant” to it, this item was considered relevant to the dimension and retained. Otherwise, it was considered irrelevant and dropped. At this point, 21 items with I-CVI less than .78 were deleted. These items were item #AU5, #AU10, #C5, #C8, #C12, #H10, #H11, #J12, #J13, #P4, #P5, #P11, #P13, #P15, #P18, #T4, #T5, #T10, #T12, #T14, and #T17. The remaining 80 items were utilized for calculating the S-CVI/Ave (the average of all I-CVIs on the scale), and an S-CVI/Ave value of .99 was achieved.

In addition, with respect to the experts’ suggestions, five items were further

excluded due to similarity with other items or poor measurability. It was indicated that in Altruism dimension, the items #AL4 “Acknowledge the nature of the nursing profession is to help others” and #AL13 “Pursue humanism to rescue the dying and health the wounded” might be too abstract to assess and were then removed. In the Autonomy dimension, the item #AU3 “Consider patients as independent individuals who should make decisions for their own health” was too similar to a better item #AU7 “Encourage patients with autonomy ability to independently make final decisions about their treatment and care plan”, and thus was deleted. In the Human Dignity dimension, the item #H4 “Seek assistance from appropriate personnel when unfamiliar with patients’ cultures, beliefs, and/or customs” was too similar to a better item #H6 “Provide care to patients in a way consistent to their cultures, beliefs and customs”, and then was eliminated. In the Justice dimension, the meaning of the item #J8 “Take part in the fair distribution of health materials and health services in clinical settings” was considered to be included in the item #J7 “Give counsel to related authorities for equal distribution of health resources”, and thus was dropped.

Besides the above deletions, the wordings of some items were revised accordingly as well. The item “Explain to the public professional responsibilities of safeguarding lives, relieving suffering and improving people’s wellness” was added to the Professional dimension at the suggestion of an expert, and was coded as item #P20. Two experts also suggested the dimension of “Promote the development of the profession” to be “Responsibility for the development of the profession”, since it

seemed a more appropriate description of nurses' beliefs.

As a result, 26 items were deleted, and one item was added. Among the remaining 76 items, the Altruism dimension had 12 items, the Autonomy dimension had seven items, the Caring dimension had 12 items, the Human Dignity dimension had 10 items, the Justice dimension had 10 items, the Professional dimension had 14 items, and the trustworthiness dimension had 11 items. These 76 items were utilized to construct the PVS version I for the pretest.

Step 5: Results of pretest of the PVS version I

1. Face validity: the face validity of the PVS Version I with 76 items was evaluated by eight registered nurses in terms of clarity, ease of understanding, and length appropriateness of the overall questionnaire.

The results indicated that: (1) The instructions for filling out the questionnaire are clear; (2) Five items were identified as "difficult to answer and should be revised". They were item #H7 "Discuss with colleagues about issues related to patients' privacies only when necessary for work", and item #H8 "Avoid inquiring about patients' secrets unless for health care purpose" in Human Dignity dimension; item #J7 "Give counsel to related authorities for equal distribution of health resources", and item #J10 "Provide health care to patients regardless of ability to pay" in Justice dimension; and item #P7 "Voluntarily participate in national/international academic activities" in the Professional dimension. In addition, two participants suggested to remove item #H7 while remain item #H8; (3) Two items were identified as "should be

deleted", which were item #AL2 "Actively take preventive measures when patients'/clients' health is found at risk" in Altruism dimension, and item #T1 "Refuse to engage in care which is believed to be unethical by oneself" in Trustworthiness dimension; (4) No extra item was recommended to be added; (5) All of these nurses agreed the "overall questionnaire is too long" and; (6) Some item statements were deemed to represent written language instead of spoken language, though participants could understood them if they were read carefully.

The researcher then consulted some nurse educators about the items questioned by the participants. Suggestions for revision were discussed and agreed upon. The Chinese expression of the draft tool was thus refined. Item #H8 was changed to "Avoid inquiring about patients' privacies unless for health care purpose". Item #J7 was modified as "Give counsel to related authorities for equal distribution of health resources in society". Item #J10 was revised as "Provide health care to patients regardless of ability to pay in emergency cases". Item #P7 was changed to "Voluntarily participate in academic activities related to own major". Items #AL2, #H7 and #T1 were taken away from the scale, leaving 73 items for the next step. Then, the researcher returned to the eight nurses, and all changes were acknowledged.

2. Pretest for the PVS version I: the pretest for the PVS version I was conducted with 40 registered nurses. Twenty of them worked in medical wards, and 20 worked in surgical wards. In the first administration, 40 questionnaires were distributed and returned with 35 usable for computation. Two weeks later, the same procedure was

repeated. Forty questionnaires returned with 33 usable for calculation. Combined with the results of the first survey round, a total of 31 participants completed the pretest process, and the data from them were utilized for computation. The demographic characteristics of the 31 nurses are displayed in Table 5.

Table 5

Demographic Characteristics of the Pretest Samples for PVS-I (n=31)

Demographic Characteristics	Number (n)	Percentage (%)
Age (year)	28.42±4.39 (23-39)	
Working experience (year)	7.37±5.25 (0.50-20)	
Educational level		
Diploma	2	6.45
Associate degree	23	74.19
Bachelor degree	6	19.36
Departments		
Medical	16	51.61
Surgical	15	48.39

Using Cronbach's alpha coefficients, the scale's overall internal consistency reliability was .981. The internal consistency reliabilities for the seven dimensions ranged from .807 (Autonomy dimension) to .935 (Professional dimension). Using Pearson product-moment correlation coefficient, the coefficient of stability of the whole scale was .847, with those of the seven dimensions ranged from .725 (Trustworthiness dimension) to .831 (Altruism dimension). The number of items and

reliabilities of the seven subscales as well as the overall scale are presented in Table 6. The average reported time required for filling out both the demographic form and the PVS version I was 15.3 minutes (SD=6.29).

Table 6

Reliabilities of PVS-I in the Pretest (n=31)

Dimensions	No. of items	Cronbach's alpha	Coefficient of stability(*r*)
Altruism	11	.886	.831*
Autonomy	7	.807	.758*
Caring	11	.909	.808*
Human dignity	10	.890	.787*
Justice	10	.871	.769*
Profession	14	.935	.761*
Trustworthiness	10	.859	.725*
Total scale	73	.981	.847*

*$p<.001$

After the pretest, the PVS version I consisted of seven dimensions with 73 items. This PVS version I was then used in phase II for further examination of psychometric properties.

Phase II: Instrument Validation

Step 6: Results of field test of the PVS version I

In this step, a field test was conducted to examine the validity and reliability of the PVS Version I. Using systematic sampling method, 920 registered nurses were

recruited to fill out the questionnaires. Seven hundred and fifty-four valid cases were thus obtained and utilized for data analysis. The results are presented below by describing the participants' demographic characteristics and psychometric testing of the scale, which includes item analysis, internal consistency reliability, exploratory factor analysis and other related analyses.

Demographic Characteristics of the Participants

Of the 754 participants, most (99.34%) were females, and few (0.66%) were males. Their average age was 30.35 years (SD=6.67). The average working experiences was 9.60 years (SD=7.34). More than half of them (65.78%) had associate degree. Most (42.04%) were Junior nurses (*Hu Shi*). The majority of them (73.34%) came from medical and surgical departments. The demographic characteristics of the 754 participants are listed in Table 7.

Table 7

Demographic Characteristics of the Field-test Samples for PVS-I (n=754)

Characteristics	Number (n)	Percentage (%)
Gender		
Female	749	99.34
Male	5	0.66
Age (year)	30.35±6.67	(21-55)
Working experience (year)	9.60±7.34	(0.50-35)

Table 7 (continued)

haracteristics	Number (n)	Percentage (%)
Educational level		
Diploma	77	10.21
Associate degree	496	65.78
Bachelor degree	170	22.55
Master degree	1	0.13
Missing data	10	1.33
Professional title		
Junior nurse (*Hu Shi*)	317	42.04
Senior nurse (*Hu Li Shi*)	279	37.00
Assistant chief nurse (*Zhu Guan Hu Shi*)	133	17.64
Associate chief nurse (*Fu Zhu Ren Hu Shi*)	7	0.93
Chief nurse (*Zhu Ren Hu Shi*)	1	0.13
Missing data	17	2.26
Department		
Surgical	283	37.53
Medical	270	35.81
Ob-gyn	68	9.02
Pediatric	62	8.22
Other*	71	9.42

* Included ICU, CCU and the department of traditional Chinese medicine

Results of Psychometric Testing

The results from the field test of the PVS version I with 73 items are explained in terms of descriptive analysis, item analysis and exploratory factor analysis.

Results of descriptive analysis

The number of items, Cronbach's alpha, mean score, variance and standard deviation (SD) of each dimension and the overall instrument were calculated. The total PVS had a mean score of 208.83 (SD= 43.36, variance=1880.26), and a Cronbach's alpha of .970. Table 8 displays the characteristics of scores for each dimension and the overall scale.

Table 8

Descriptions of Scores of Each Dimension and the Overall PVS-I (n=754)

Dimension	No. of items	Cronbach alpha	Min	Max	Mean	SD	Variance
Altruism	11	.857	9.00	44.00	30.16	7.66	58.70
Autonomy	7	.750	4.00	28.00	19.31	5.03	25.31
Caring	11	.862	8.00	44.00	30.87	7.50	56.22
Human Dignity	10	.829	8.00	40.00	30.54	6.39	40.80
Justice	10	.824	7.00	40.00	28.60	6.45	41.61
Professional	14	.885	10.00	56.00	38.60	9.57	91.65
Trustworthiness	10	.825	10.00	40.00	30.74	6.15	37.79
Total scale	73	.970	83.00	285.00	208.83	43.36	1880.26

Results of item analysis

To estimate the item's function in each dimension as well as the total instrument construct, item analysis was conducted. The Pearson product-moment correlation coefficients were calculated for corrected item-total, corrected item-subscale, inter-item, and subscale-subscale correlations. The Cronbach's alpha was computed to assess the internal consistency reliability of each dimension and the total scale.

The corrected item-total correlation coefficient was computed by using item means and the sum of all remaining items on the scale. In this study, those values of 73 items were all above .30 (from .366 to .640). In addition, the corrected item-subscale correlation coefficient was calculated between items and all the other items in the same dimension. The results revealed that five items had item-subscale coefficients lower than .30. They are item #AL10 in altruism dimension (r=.263), #AU2 in autonomy dimension (r=.287), #C11 in caring dimension (r=.295), #J5 in justice dimension (r=.246), and #P9 in Professional dimension (r=.293).

The correlation coefficients between items were also assessed. The values ranged from .180 to .586. Among the 73 items, ten had inter-item coefficients lower than .30 with more than half of the items in their corresponding dimensions. They were item #AL5 (6 out of 10 item pairs had coefficients lower than .30, i.e., 6/10) and #AL9 (7/10) in altruism dimension, item #C3 (7/10) in caring dimension, item #H1 (6/9) and #H3 (7/9) in human dignity dimension, item #J7 (7/9) and #J11 (6/9) in justice dimension, and item #P16 (9/13) and #P8 (7/13) in Professional dimension,

and item #T16 (7/9) in trustworthiness dimension.

An examination of the internal consistency of the overall scale showed that the Cronbach's alpha coefficient would remain .970 if items #AU2, #H3 and #P16 were eliminated one by one, or decrease to .969 if the other 12 aforementioned items were removed respectively. After removing these 15 items, the Cronbach's alpha of the overall scale was .964. Moreover, the Cronbach's alpha coefficients for each corresponding dimension would slightly increase or not substantially decrease if those above 15 items were deleted.

The subscale-subscale and subscale-total correlation coefficients are listed in Table 9. Subscale-subscale correlations were evaluated with the subscale means between each pair. The magnitudes of this index varied from .668 to .809, indicating moderate to high correlations. The subscale-total correlations were assessed with the means of the subscales and the mean of the total scale. They ranged from .823 to .914, signifying high correlations.

In sum, though all items had corrected item-total correlation coefficients higher than .30, five of them obtained low item-subscale correlations, and 10 had low inter-item correlations with more than half of the items in their corresponding dimensions. Removing them would not significantly affect the Cronbach's alphas of related dimensions and the total scale. As a result, these 15 items (item #AL5, #AL9, #AL10, #AU2, #C3, #C11, #H1, #H3, #J5, #J7, #J11, #P8, #P9, #P16 and #T16) were deleted. The remaining 58 items were used for the exploratory factor analysis.

Table 9

Subscale-subscale and Subscale-total Correlations of PVS-I before Exploratory Factor Analysis (73 items)

Dimension	D1	D2	D3	D4	D5	D6	D7	TS
Altruism (D1)	1.00							
Autonomy (D2)	.713*	1.00						
Caring (D3)	.781*	.728*	1.00					
HD (D4)	.729*	.729*	.780*	1.00				
Justice (D5)	.806*	.695*	.802*	.787*	1.00			
Professional (D6)	.797*	.668*	.791*	.759*	.809*	1.00		
TW (D7)	.720*	.682*	.729*	.750*	.720*	.743*	1.00	
Total scale (TS)	.900*	.823*	.908*	.887*	.907*	.914*	.856*	1.00

*p<.001

Note: HD=Human Dignity; TW=Trustworthiness.

Results of exploratory factor analysis

To examine the construct validity of the 58-item PVS, an exploratory factor analysis, principal component method with varimax rotation was performed.

The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy and *Bartlett's test of sphericity* were conducted to evaluate the appropriateness of the 58-item PVS data for proceeding with the factor analysis (Dixon, 2005). The results showed a KMO value of .962, indicating sample adequacy for factor analysis. *Bartlett's test of sphericity* was significant (p<.001) with the chi-square value of 20989.446, denoting

that the variables were in linear relationship. Therefore, the results of both the KMO and *Bartlett's test* met criteria and verified further use of factor analysis for the data.

To extract factors, components with eigenvalues greater than 1 were considered principal and were retained (Dixon, 2005). The results of the first exploratory factor analysis indicated nine factors had eigenvalues from 19.306 to 1.024 and thus were retrieved. They accounted for 55.262% of the total variance. Furthermore, item #AL1, #AL12, #AU8, #J3 and #P3 had factor loadings lower than .40, an indication of unsuitable variables (Polit & Beck, 2004). These five items were eliminated accordingly. Then the exploratory factor analysis was performed stepwise following the same procedures. Totally another 11 items (item#C4, #C6, #C9, #C13, #C14, #H6, #J1, #J2, #J10, #P2, and #T3) were removed through this process.

In the end, seven factors with eigenvalues greater than 1 were generated and 42 items retained. All the 42 remaining items had loading values greater than .40 on only one of the seven factors, and could be meaningfully explained in their corresponding components. Table 10 lists the variables that cluster under each of the seven components. The item statements and factor loadings are presented in a descending order in the table. The dimensions are named according to the contents of their corresponding item statements.

Table 10

Item Number, Item Statement and Loadings on the Corresponding Factors

	Item number and item statement	Factor loadings
Component 1-Responsibility for the development of the profession		
P7	Voluntarily participate in academic activities related to own major.	.691
P12	Actively participate in scientific research.	.653
P19	Concern about social trends and issues related to the development of the nursing profession.	.630
P17	Actively participate in establishing and implementing acceptable standards of clinical nursing practice, management, research and/or education.	.603
P20	Explain to the public professional responsibilities of safeguarding lives, relieving suffering and improving people's wellness.	.554
P6	Voluntarily join professional nursing associations and participate in activities.	.461
P14	Offer consultation and assistance in caring when requested by other health care providers.	.435
	Eigenvalue=13.951; Percent of variance=33.217	

	Item number and item statement	Factor loadings
Component 2-Respecting People		
H13	Maintain a co-operative relationship with co-workers in nursing and other fields.	.640
H12	Act to protect patients' peace and dignity at the end of their life.	.638
J9	Treat each patient equally irrespective of their social and/or economic status.	.631
H14	Establish and maintain a mutually trusted nurse-patient relationship	.596
H9	Maintain patients' documents only accessible to authorized people	.594
H8	Avoid inquiring about patients' privacies unless for health care purpose.	.585
H2	Avoid sneering at or discriminating against patients' health problems, e.g., STD.	.483
	Eigenvalue=2.342; Percent of variance=5.576	
Component 3-Caring & Mutual Interaction		
C1	Present sufficient understanding and compassion to patients through communication.	.740
J6	Allocate proportionate nursing care to patients based on their health needs.	.626

	Item number and item statement	Factor loadings
C10	Convey emotional support to patients by appropriate non-verbal communication, such as eye contact and touch.	.621
AU6	Obtain conscious patient agreement before each nursing operation.	.558
H5	Consider patients' dignity and feelings when applying advanced health science and technology.	.542
C2	Actively help patients find a way to relieve depressive feelings.	.537
C7	Attentively and patiently listen to patients' feelings about their diseases and treatments.	.519
	Eigenvalue=1.973; Percent of variance=4.698	
Component 4-Altruism		
J4	Participate in activities designed to spread nursing and health care to underserved areas and vulnerable population.	.726
AL6	Help patients reduce costs if possible under the condition of ensuring care effects.	.657
AL7	Act to seek social support for patients if necessary.	.591
AL11	Endeavor to serve patients even if they have misconception and prejudice about nursing.	.557
AL3	Share other nurses' workload after finishing own.	.518

	Item number and item statement	Factor loadings
AL8	Share professional knowledge and experiences with other nurses without reservation.	.487
AL14	Tailor care plan in accordance to individual patient's psycho-physical needs at any time.	.461
	Eigenvalue=1.487; Percent of variance=3.541	
Component 5-Responsibility & Accountability		
T6	Be sure to try one's best to keep promises to patients.	.633
P1	Continuously reflect on and summarize lessons and experiences at work.	.628
T11	Seek to remedy errors made by self or others at work to ensure safe patient outcomes.	.594
T13	Assume responsibility and accountability for professional judgment and professional practice.	.572
T8	Protect patients' safety by confronting related health care providers about malpractice.	.561
	Eigenvalue=1.305; Percent of variance=3.106	
Component 6-Reliable Performance		
T7	Strictly follow established practice standards in nursing care.	.647
T2	Honestly report all malpractice and errors at work.	.612
T15	Follow practice standards whether being supervised or not.	.574
T9	Document nursing care accurately and honestly.	.557

	Item number and item statement	Factor loadings
P10	Voluntarily participate in continuing education to update professional knowledge and skills.	.532
	Eigenvalue=1.190; Percent of variance=2.834	
Component 7-Autonomy		
AU1	Ensure patients' perspectives are related to appropriate relatives or health care professionals when the patient loses judgment ability.	.639
AU9	Provide sufficient information about care and treatment within professional boundaries.	.523
AU4	Honor patients' right to refuse treatment and/or care.	.505
AU7	Encourage patients with autonomy ability to independently make final decisions about their treatment and care plan.	.494
	Eigenvalue=1.039; Percent of variance=2.475	
	Cumulative percent of variance=55.447	

At this point, the internal consistency reliabilities of the subscales and the whole scale were summarized in Table 11. The reliability coefficient of the overall scale was .950. The Altruism dimension had the highest Cronbach's alpha (.846), and the Autonomy dimension got the lowest one (.702).

Table 11

Reliabilities of PVS-I after Exploratory Factor Analysis (n=754)

Component	No. of items	Cronbach's alpha
Professional	7	.844
Respecting People	7	.835
Caring & Mutual Interaction	7	.844
Altruism	7	.846
Responsibility & Accountability	5	.749
Reliable Performance	5	.745
Autonomy	4	.702
Total scale	42	.950

The subscale-subscale correlation and subscale-total coefficients are listed in Table 12. Each pair of the seven components was moderately correlated with Pearson correlation coefficients (*r*) ranging from .474 to .690. The subscale-total correlations coefficients ranged from .723 (Reliable Performance dimension) to .841 (Professional dimension), signifying high correlation.

Then the remaining 42 items constituted the PVS version II, and was subjected to stability testing.

Table 12

Subscale-subscale and Subscale-total Correlations of PVS-I after Exploratory Factor Analysis (42 items)

Dimension	D1	D2	D3	D4	D5	D6	D7	TS
Professional (D1)	1.00							
ResPeople (D2)	.618*	1.00						
C&MI (D3)	.624*	.667*	1.00					
Altruism (D4)	.690*	.550*	.567*	1.00				
R&A (D5)	.546*	.536*	.483*	.525*	1.00			
RelPerform(D6)	.503*	.603*	.541*	.474*	.556*	1.00		
Autonomy (D7)	.526*	.567*	.575*	.645*	.551*	.511*	1.00	
Total scale (TS)	.841*	.822*	.817*	.824*	.730*	.723*	.766*	1.00

*p<.001

Note: ResPeople =Respecting People; C&MI= Caring & Mutual Interaction; R&A= Responsibility & Accountability; and RelPerform= Reliable Performance.

Step 7: Results of the testing of the PVS version II

The PVS version II with 42 items was distributed to 110 registered nurses twice before and after a two-week interval by a research assistant. In the first administration, 107 questionnaires were returned with 98 valid for computation. In the second administration, 104 questionnaires were returned with 95 valid for calculation. All together, 89 participants completed the evaluation process with valid data provided. The demographic characteristics of the samples are displayed in Table 13.

Table 13

Demographic Characteristics of the Samples for PVS-II (n=89)

Demographic Characteristics	Number (n)	Percentage (%)
Gender		
Female	86	96.63
Male	3	3.37
Age (year)	30.40±7.13	(20-54)
Working experience (year)	9.64±8.13	(0.50-34)
Educational level		
Diploma	8	8.99
Associate degree	59	66.29
Bachelor degree	22	24.72
Department		
Medical	33	37.07
Surgical	28	31.46
ICU	10	11.24
Ob-gyn	8	8.99
Other	10	11.24

Using Cronbach's Alpha, the scale's overall internal consistency reliability was .943. The Cronbach's alphas for the seven dimensions ranged from .676 (Autonomy dimension) to .800 (Professional dimension). Using Pearson product-moment correlation coefficient, the test-retest reliability of the total scale

was .878, with those of the dimensions varying from .736 (Autonomy dimension) to .853 (Respecting People dimension). The internal consistency reliability and stability of the PVS version II are listed in Table 14.

Table 14

Reliabilities of PVS-II (n=89)

Dimensions	No. of items	Cronbach's alpha	Coefficient of stability (*r*)
Professional	7	.800	.804*
Respecting people	7	.797	.853*
C&MI	7	.788	.838*
Altruism	7	.797	.817*
R&A	5	.782	.793*
RelPerform	5	.763	.779*
Autonomy	4	.676	.736*
Total scale	42	.943	.878*

*$p<.001$

Note: C&MI= Caring & Mutual Interaction; R&A= Responsibility & Accountability; and RelPerform= Reliable Performance.

Summary

The Professional Values Scale (PVS) for registered nurse was developed in two phases. In phase one, a professional values framework for Chinese registered nurses was constructed. Guided by this framework, the Professional Values Scale (PVS) was developed. A series of psychometric property tests were conducted. The evidence for

content validity of the proposed items was supported by ratings of six experts with an S-CVI/Ave of .990.

In phase two, a field test was conducted with 754 valid 73-item PVS version I obtained and used for data analyses. Fifteen items were excluded after the item analysis, and 16 items were dropped after the factor analyses. As a result, the PVS version II consisted of 42 items with seven dimensions. The overall Cronbach's alpha was .950, and the Cronbach's alphas for the seven dimensions varied from .702 (Autonomy dimension) to .846 (Altruism dimension). In addition, the overall test-retest reliability of the PVS version II was .878 (p<.001) with a Cronbach's alpha of .943.