

Psychometric properties of Nurses Professional Values Scale-Revised: An Iranian version

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Abstract

Background

Professional values are the basis of development of professional identity and commitment. Evaluation of professional values provides critical information regarding effective strategies for their integration in professional performance and clinical learning. The present study aimed to determine the psychometric properties of Nurses Professional Values Scale-Revised (NPVS-R) in Iranian population.

Methods

This methodological study was conducted on 439 students in the last semester of nursing selected from Iran's universities using stratified single-stage cluster sampling. After back translation, its face, content, and construct validity were assessed. Its reliability was also evaluated by determining Cronbach's alpha using internal consistency method. All analyses were performed using the SPSS statistical software, version 19.

Results

Considering face validity, all items' impact scores were above 1.5. Regarding content validity, CVR and CVI of all components were > 0.6 and $= 1$, respectively. After exploratory factor analysis, the number of items was reduced to 25 and five factors explained 52.26% of the total variance. Moreover, the reliability coefficient was 0.53–0.83 for the factors and 0.91 for the whole scale.

Conclusions

The Persian version of NPVS-R had acceptable validity and reliability in Iranian context. Yet, further studies have to be conducted on this instrument with different cultural backgrounds.

Background

Values refer to ideals and beliefs that direct behaviors and provide a basis for decision-making and action [1]. Professional values are the basis of development of professional identity and commitment [2]. These values are in fact standards for action, which are acceptable by the professional group, provide a framework for evaluation of effective values and beliefs in behavior [3].

Nursing profession is full of values. Florence Nightingale in the 19th century stated that not only nursing includes scientific knowledge and technical skills, but it could also be perceived based on specific human values [4]. Nursing professional values have been specifically defined in "B.Sc. educational necessities for professional nurses' performance" provided by American Association of Colleges of Nursing (AACN,

1998) [5], which is used to direct accreditation of curricula of B.Sc. and higher education levels [5]. The professional values planned in AACN include human dignity, integrity, autonomy, altruism, and social justice [6]. American Nurses Association (ANA) has also presented directions for professional values in “Code of Ethics for Nurses with Interpretive Statements” [7]. In order to introduce issues related to spiritual and ethical health in the 21st century, nurses and their colleagues have to refer to professional values to direct their professional performance, behavior, and decision-making [7]. Although nursing curricula may follow reliable guides for benefitting from professional values, a limited number of them might be aware of the rate of success in acquiring learning outcomes related to professional values [8, 9].

Understanding how to develop professional values is of particular importance in future of nursing profession [10, 11]. In this context, evaluation of professional values can provide valuable information about effective strategies for integration and application of professional values in professional performance and clinical learning [12].

In order for an instrument to be usable in a community, it should benefit from appropriate reliability and validity [13]. Validity refers to accuracy and credibility of a study [14]. Additionally, reliability means obtaining similar results in repeated measurements using a single instrument [14]. Therefore, reliability and validity of NPVS-R are the requirements of its applicability in Iranian community.

Limited studies have been conducted on nurses’ professional values in Iran [15–17] and Asia [18–20]. On the other hand, using valid and reliable Persian version of NPVS-R can enhance the importance of professional values and ethical codes for nurses in Iranian society [21]. Considering the importance of institutionalizing and applying professional values, the present study aims to assess the psychometric properties of NPVS-R in Iranian population.

Background And Conceptual Framework

Considering investigation of professional values, various instruments were used in researches between 1970 and 1977, which resulted in creation of different databases that were not generalizable. Although there are several instruments for evaluation of professional values, only one; i.e., Nurses Professional Values Scale (NPVS), is based on ANA’s code of ethics for nurses. Modification of nurses’ code of ethics in 2001 accelerated the process of reviewing NPVS [22], which resulted in creation of Nurses Professional Values Scale-Revised (NPVS-R). Due to general application of ANA’s codes and their similarity to laws issued by the International Council of Nurses and other codes, such as those developed in Iran [21], this instrument can be used in different communities including Iran.

Methods

The instrument used in this study was NPVS-R developed by Weis and Schank, which is the only instrument measuring nurses’ professional values based on ethical codes [21]. NPVS-R is in fact the modified version of NPVS. It contains 26 items for assessing nurses’ professional values. This instrument

consists of 5 factors, namely care (9 items: 16,17, 18, 20, 21, 22, 23, 24, 25), activism (5 items: 4, 10, 11, 19, 26), trust (5 items: 1, 2, 9, 14, 15), professionalism (4 items: 5, 6, 7, 8), and justice (3 items: 3, 12, 13). The items are responded through a 5-point Likert scale with the following options: not important (1), not very important (2), relatively important (3), important (4), and very important (5). Thus, the total score of the scale can range from 26 to 130, with higher scores representing more familiarity with professional values. Primary assessment of NPVS-R indicated appropriate reliability and validity. Accordingly, Cronbach's alpha coefficients of the items were between 0.73 and 0.87 [23].

In the present study, permission was obtained from the developers of the instrument. The scale was first translated to Persian by a bilingual translator who was familiar with nursing profession. Then, three experts in nursing evaluated the scale regarding appropriateness with Iranian culture. After slight modifications, the scale was back translated to English. The back translated version was quite similar to the original version, indicating no need for modifications in the Persian version.

Validity refers to the extent an instrument measures what it is supposed to measure [24, 25]. In the current study, face validity, content validity, and construct validity were taken into account. Face validity refers to evaluation of an instrument's outward credibility, being logical, appropriateness, attractiveness, rationality, logical sequencing, and comprehensibility from target population's perspective [26]. In addition, content validity refers to the extent an instrument contains appropriate items to the intended construct [26]. Finally, construct validity refers to the extent an instrument measures what it is supposed to measure [26].

In order to assess the face and content validity of NPVS-R, it was given respectively to 10 nursing students and 12 experts in nursing and instrumentation in Shiraz and Tabriz universities of medical sciences. Considering qualitative face validity, the items were evaluated with respect to level of difficulty, vagueness, failure in meaning, appropriateness (relationship between the items and the main goal of the scale), simplicity, fluency, and understandability. In quantitative face validity, item impact method was employed using a 5-point Likert scale ranging from not important (1) to very important (5) to determine the impact score. The items with impact scores > 1.5 were maintained for further analyses.

In order to assess the content validity of NPVS-R, Content Validity Rate (CVR) and Content Validity Index (CVI) were computed. In doing so, assessors were required to evaluate the scale items based on Lawshe table. Lawshe invented a method to determine content validity. In this method, a questionnaire is given to a panel to mention their opinions about each item within a predetermined judgement scale. Then, the panel's responses are coded as follows: essential, useful but not essential, and not necessary [27, 28]. After obtaining the experts' opinions in the present study, items with CVR > 0.6 were maintained and the rest were omitted. In this formula, Ne represents the number of experts who consider the item essential and N represents the total number of experts.

$$CVR = \frac{N - N/2}{N/2}$$

After that, the experts were required to determine the items' relevance, clarity, and simplicity using a score between 1 and 4 based on Waltz and Bausell's index. Accordingly, items with $CVI > 0.79$ were appropriate, those with $0.70 \leq CVI \leq 0.79$ were questionable requiring modification, and those with $CVI < 0.70$ were unacceptable.

Finally, construct validity was evaluated using exploratory factor analysis with varimax rotation. In order to extract factors, Eigenvalues > 1 and scree plots were employed. It should be noted that factor load value was considered to be above 0.4. Besides, nearly 17 samples per item completed the questionnaires. In this way, after getting permission from the Ethics Committee of Tabriz University of Medical Sciences (No: IR.TBZMED.REC.1390.112), 439 senior nursing students were selected from Iran's universities using stratified single-stage cluster sampling. Among the participants, 286 (65.4%) were female and 151 (34.6%) were male. In addition, their mean age was 22.56 ± 1.08 years.

Reliability means obtaining similar results in repeated measurements using a single instrument [26]. Reliability coefficients > 0.7 are acceptable, but those between 0.85 and 0.95 are preferred [29]. In the present study, the reliability of the instrument was assessed using internal consistency by determining Cronbach's alpha coefficient. In doing so, a descriptive study was conducted by the researcher. Considering the necessity to use Cronbach's alpha coefficient for investigating reliability in questionnaires with Likert scales [30], internal consistency method by determining Cronbach's alpha coefficient was used in the present study.

Results

For investigation of face validity in this study, quantitative and qualitative approaches were taken into account. Considering qualitative face validity, the questionnaire was given to 10 nursing students and their opinions were applied in form of slight changes. In quantitative face validity, item impact method was used to determine impact scores. Based on the results, all components' impact scores were above 1.5 (Table 1). Therefore, all questionnaire items were entered into the next evaluation stage, which was related to content validity.

Table 1
Impact Score of items of Nurses Professional Values Scale-R

Items	Impact Score
	Frequency (%) \times Importance
1. Engage in on-going self-evaluation.	$1 \times 5 = 5$
2. Request consultation/collaboration when unable to meet patient needs.	$1 \times 5 = 5$
3. Protect health and safety of the public.	$0.9 \times 4.3 = 3.87$
4. Participate in public policy decisions affecting distribution of resources.	$1 \times 4.4 = 4.4$
5. Participate in peer review.	$0.9 \times 4.2 = 3.78$
6. Establish standards as a guide for practice.	$1 \times 4.9 = 4.9$
7. Promote and maintain standards where planned learning activities for students take place.	$0.9 \times 4.4 = 3.96$
8. Initiate actions to improve environments of practice.	$1 \times 5 = 5$
9. Seek additional education to update knowledge and skills.	$1 \times 5 = 5$
10. Advance the profession through active involvement in health related activities.	$1 \times 4.9 = 4.9$
11. Recognize role of professional nursing associations in shaping health care policy.	$1 \times 5 = 5$
12. Promote equitable access to nursing and health care.	$1 \times 4.8 = 4.8$
13. Assume responsibility for meeting health needs of the culturally diverse population.	$1 \times 5 = 5$
14. Accept responsibility and accountability for own practice.	$1 \times 5 = 5$
15. Maintain competency in area of practice.	$1 \times 5 = 5$
16. Protect moral and legal rights of patients.	$1 \times 5 = 5$
17. Refuse to participate in care if in ethical opposition to own professional values.	$1 \times 4.6 = 4.6$
18. Act as a patient advocate.	$1 \times 5 = 5$
19. Participate in nursing research and/or implement research findings appropriate to practice.	$1 \times 4.9 = 4.9$
20. Provide care without prejudice to patients of varying lifestyles.	$1 \times 5 = 5$
21. Safeguard patient's right to privacy.	$1 \times 4.9 = 4.9$
22. Confront practitioners with questionable or inappropriate practice.	$0.9 \times 4.4 = 3.96$

Items	Impact Score
	Frequency (%) \times Importance
23. Protect rights of participants in research.	$1 \times 5 = 5$
24. Practice guided by principles of fidelity and respect for person.	$1 \times 5 = 5$
25. Maintain confidentiality of patient.	$1 \times 5 = 5$
26. Participate in activities of professional nursing associations.	$1 \times 4.9 = 4.9$

Considering investigation of qualitative content validity, the questionnaire was given to experts and they were required to provide their written opinions about content coverage, grammar, usage of appropriate phrases, proper scoring, time required for completion, appropriateness of domains, and location of items. The obtained results were in line with those of qualitative face validity. Accordingly, the questionnaire components were quite simple and clear and, consequently, no modifications were performed.

CVR and necessity of items were assessed using Lawshe table. Accordingly, the items with CVR > 0.6 were maintained. Based on the results, CVR of all questionnaire items was between 0.6 and 1 (Table 2). Thus, all components were maintained at this stage.

Content validity was evaluated using CVI proposed by Waltz and Bausell [28] and the results have been presented in Table 2. As the table depicts, CVI was above 0.79 for all items and above 0.9 for the whole scale. Thus, all items were accepted at this stage. In addition, all items showed appropriate simplicity and clarity and, consequently, no modifications were needed.

Table 2
Content Validity Ratio (CVR) and Content Validity Index (CVI) of items of Nurses Professional Values Scale-R

Items	Content Validity Index (CVI)	Content Validity Ratio (CVR)
1. Engage in on-going self-evaluation.	1	1
2. Request consultation/collaboration when unable to meet patient needs.	1	1
3. Protect health and safety of the public.	1	1
4. Participate in public policy decisions affecting distribution of resources.	1	0.6
5. Participate in peer review.	1	0.6
6. Establish standards as a guide for practice.	1	1
7. Promote and maintain standards where planned learning activities for students take place.	1	0.6
8. Initiate actions to improve environments of practice.	1	1
9. Seek additional education to update knowledge and skills.	1	1
10. Advance the profession through active involvement in health related activities.	1	0.6
11. Recognize role of professional nursing associations in shaping health care policy.	1	0.8
12. Promote equitable access to nursing and health care.	1	0.6
13. Assume responsibility for meeting health needs of the culturally diverse population.	1	0.8
14. Accept responsibility and accountability for own practice.	1	0.8
15. Maintain competency in area of practice.	1	1
16. Protect moral and legal rights of patients.	1	0.8
17. Refuse to participate in care if in ethical opposition to own professional values.	1	0.6
18. Act as a patient advocate.	1	0.8
19. Participate in nursing research and/or implement research findings appropriate to practice.	1	0.6
20. Provide care without prejudice to patients of varying lifestyles.	1	0.8
21. Safeguard patient's right to privacy.	1	0.8

Items	Content Validity Index (CVI)	Content Validity Ratio (CVR)
22. Confront practitioners with questionable or inappropriate practice.	1	1
23. Protect rights of participants in research.	1	0.8
24. Practice guided by principles of fidelity and respect for person.	1	1
25. Maintain confidentiality of patient.	1	0.8
26. Participate in activities of professional nursing associations.	1	1

In this study, exploratory factor analysis was done to determine the factors of NPVS-R. Prior to this analysis, Kaiser-Meyer-Olkin (KMO) criteria were assessed in order to determine the appropriateness of factor analysis. Based on the results, KMO = 0.93 showed perfect factor analysis. The results of Bartlett's sphericity test were also statistically significant ($df = 325$, $\chi^2 = 3.441$, $p < 0.001$). Afterwards, exploratory factor analysis of the five main domains of NPVS-R was determined using varimax rotation by exclusion of items with factor loads < 0.4 . The factors included care (6 items: 16, 18, 20, 21, 24, 25), professionalism (7 items: 1, 2, 6, 7, 8, 9, 10), activism (5 items: 11, 19, 22, 23, 26), responsibility (4 items: 12, 13, 14, 15), and social commitment (3 items: 3, 4, 5), which explained 52.26% of the total variance. The results of factor analysis and factor loads have been presented in Table 3. Accordingly, factor load of "not participating in cares that are ethically opposed to my professional values" was 0.29 and, as a result, the item was omitted from the questionnaire (Table 3).

Table 3
Rotated factor loadings of items of the scale (n = 439).

Items of the scale	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5
	care	professionalism	activism	responsibility	social commitment
25. Maintain confidentiality of patient.	0.73				
21. Safeguard patient's right to privacy.	0.67				
16. Protect moral and legal rights of patients.	0.64				
20. Provide care without prejudice to patients of varying lifestyles.	0.62				
24. Practice guided by principles of fidelity and respect for person.	0.59				
18. Act as a patient advocate.	0.56				
9. Seek additional education to update knowledge and skills.		0.68			
7. Promote and maintain standards where planned learning activities for students take place.		0.65			
10. Advance the profession through active involvement in health related activities.		0.58			
6. Establish standards as a guide for practice.		0.58			
8. Initiate actions to improve environments of practice.		0.58			
1. Engage in on-going self-evaluation.		0.49			
2. Request consultation/collaboration when unable to meet patient needs.		0.47			

Items of the scale	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5
	care	professionalism	activism	responsibility	social commitment
26. Participate in activities of professional nursing associations.			0.69		
19. Participate in nursing research and/or implement research findings appropriate to practice.			0.67		
23. Protect rights of participants in research.			0.62		
11. Recognize role of professional nursing associations in shaping health care policy.			0.55		
22. Confront practitioners with questionable or inappropriate practice.			0.44		
13. Assume responsibility for meeting health needs of the culturally diverse population.				0.78	
14. Accept responsibility and accountability for own practice.				0.59	
12. Promote equitable access to nursing and health care.				0.47	
15. Maintain competency in area of practice.				0.46	
5. Participate in peer review.					0.75
4. Participate in public policy decisions affecting distribution of resources.					0.55
3. Protect health and safety of the public.					0.42
17. Refuse to participate in care if in ethical opposition to own professional values.			0.29		

Items of the scale	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5
	care	professionalism	activism	responsibility	social commitment
Variance (%)	32.25	6.38	5.23	4.21	4.19

Investigation of the reliability of the questionnaire revealed Cronbach's alpha coefficient of 0.91 for the whole instrument. Indeed, Cronbach's alpha coefficients of 0.83, 0.81, 0.72, 0.75, and 0.53 were computed for care, professionalism, activism, responsibility, and social commitment factors, respectively.

Discussion

The study results indicated that NPVS-R benefitted from appropriate validity (face and content validity) and reliability, which is consistent with the results of other studies conducted on the issue [21, 31, 32]. Studies have also proved the validity of English, Spanish, Chinese, Turkish, and Korean versions of NPVS-R. Similarly, Weis and Schank (2009) assessed qualitative face validity of NPVS-R among B.Sc. and M.Sc. nursing students and clinical nurses [21]. Considering quantitative face validity, all components showed impact scores > 1.5 in the current study and, consequently, all items were entered into the next stage that was related to content validity.

With respect to qualitative content validity in the research by Weis and Schank (2009), NPVS-R was investigated regarding sufficiency, relatedness to ethical codes, clarity, and meaning. The results revealed 100% agreement and all items were maintained with slight changes in words. That study also confirmed the content validity of the original version of this instrument [21].

In the present study, CVR of all components of the scale ranged from 0.6 to 1. Therefore, all components of the scale were maintained at this stage. Review of the literature showed that no studies have assessed the CVR of NPVS-R.

Our study also demonstrated that CVIs of the items and the whole scale were equal to 1. Thus, all items were accepted. In the same line, Lin and Wang evaluated content validity using CVI. In that study, seven experts including two nurses, two head nurses, one supervisor, and two assistant professors scored the Chinese version of NPVS-R with regard to relevance, clarity, and simplicity. Based on the results, CVI ranged from 0.8 to 1 and was equal to 0.9 for the final version [33]. Geckil et al. (2012) also investigated the reliability and validity of the Turkish version of NPVS-R. The findings indicated CVIs between 0.78 and 1 for the items and 0.93 for the whole scale [31]. Considering CVIs obtained in the present study and other studies conducted on the issue, all items of NPVS-R have acceptable validity.

With regard to construct validity in the current study, KMO was 0.93 and Bartlett's sphericity test was statistically significant. In addition, exploratory factor analysis determined five main domains of NPVS-R by varimax rotation and exclusion of items with factor loads < 0.4. These factors included care (6 items),

professionalism (7 items), activism (5 items), responsibility (4 items), and social commitment (3 items), which explained 52.26% of the total variance. It should be noted that item 17 (not participating in cares that are ethically opposed to my professional values) was excluded because its factor load was below the threshold value.

In line with the present study, Weis and Schank (2009), Geckil et al. (2012), and Moon et al. (2014) reported KMO criteria to be 0.93, 0.92, and 0.95, respectively. Bartlett's sphericity test was also statistically significant in the above-mentioned studies ($p < 0.001$), which revealed appropriateness of factor analysis for construct validity of the data [21, 31, 32]. In the research by Weis and Schank (2009), the results of principal components analysis with varimax rotation and Kaiser normalization demonstrated that five factors, namely care, activism, professionalism, justice, and trust, explained 56.7% of the variance. Factor analysis also showed the high validity of the original version of the instrument [21]. Similarly, Moon et al. (2014) investigated the Korean version of NPVS-R using factor analysis. The findings indicated that five factors explained 58.90% of the total variance and that limited cross loading existed. In that study, the instrument's structure was somehow different from the original version, resulting in somewhat different factors; i.e., professionalism, human dignity, innovation, contribution, and advocacy. Overall, the Korean version of NPVS-R was found to be valid for assessment of nursing professional values [32]. Geckil et al. (2012) also conducted a research on reliability and validity of the Chinese version of NPVS-R. In that study, the results of exploratory factor analysis revealed five factors; i.e., care, professionalism, trust, justice, and activism, which explained nearly 54.5% of variance [31]. Basurto Hoyuelos (2010), too, evaluated the Spanish version of NPVS-R. The results indicated that the Spanish version was similar to the English version regarding meaning and culture and that it was appropriate for assessment of nursing professional values among nurses and students in Spain [34].

Based on what was mentioned above, psychometric analysis of NPVS-R has revealed the high construct validity of the instrument in various studies. Irrespective of the similar number of factors, due to differences among societies regarding cultural and social context and professional policymaking, the overall structure, subcategories, and titles of items were somewhat different from the original version.

The present study findings revealed that NPVS-R was a reliable instrument. Reliability of English, Chinese, Turkish, and Korean versions of this instrument has also been computed using Cronbach's alpha coefficient in various studies. In the original version of the instrument, Cronbach's alpha coefficient was 0.92 for the whole scale and ranged from 0.70 to 0.85 for the dimensions (14). Considering the Korean, Turkish, and Chinese versions, Cronbach's alpha coefficient of the whole scale was 0.93, 0.92, and 0.90, respectively. Cronbach's alpha coefficients of the dimensions also ranged from 0.62 to 0.89, 0.0 to 0.84, and 0.81 to 0.90, respectively [31–33] (29–31). In the same line, Lin et al. (2010) performed a study in Taiwan and reported Cronbach's alpha coefficient of 0.90 for the whole instrument and 0.81–0.90 for its dimensions [10]. Lakobusi et al. (2012) also reported Cronbach's alpha coefficient of 0.93 for the whole scale [35].

IMPLICATIONS IN NURSING

The Persian version of NPVS-R can be used for assessment and supervision prior to interventions, evaluation and development of nursing professional values after interventions, and investigation of nursing professional values over time. Moreover, using NPVS-R can enhance nurses' awareness about the importance of professional values and codes of ethics.

Conclusions

The Persian version of NPVS-R had appropriate reliability and validity in Iranian context and could be used among nurses, nursing instructors and students, and all individuals involved in nursing profession. Yet, further studies are recommended to evaluate the psychometric properties of this instrument using more assessors and experts in the field of professional values in Iran. Future investigations should also be performed on this instrument among nurses and students with various cultural backgrounds.

Abbreviations

NPVS-R: Nurses Professional Values Scale-Revised; AACN: American Association of Colleges of Nursing; ANA: American Nurses Association; NPVS: Nurses Professional Values Scale; CVR: Content Validity Ratio; CVI: Content Validity Index; KMO: Kaiser-Meyer-Olkin.

Declarations

Ethics approval and consent to participate

The study was approved by the Ethics Committee of Tabriz University of Medical Sciences (IR.TBZMED.REC.1390.112). Informed consents were obtained from all participants.

Consent for publication

Not applicable.

Availability of data and materials

The datasets generated and/or analysed during the current study are not publicly available due to patient confidentiality but are available from the corresponding author on reasonable request.

Competing interests

The authors declare that they have no competing interests.

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Authors' contributions

FA.H, LZ, KP and BT were responsible for the study conception and design; FA.H and SB performed the data collection; FA.H, LZ, KP, and SB performed the data analysis; FA.H, LZ and BT were responsible for the drafting of the manuscript; FA.H, LZ, KP and BT made critical revisions to the paper for important intellectual content.

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