RESEARCH



Translation and psychometric validation of the Chinese version of the Nurses' Work Value Scale: a cross-sectional study



Yuecong Wang¹, Xin Wang², Yaling Ji^{3*}, Tianxiang Jiang^{4,5} and Meigui Bao⁵

Abstract

Background Nurses' work values constitute the core driving force of their professional careers. These values deeply reflect an individual's comprehensive understanding of the nursing profession, positive attitudes toward it, and aspirations for its goals. However, there is currently no specific scale available in China for assessing nurses' work values.

Objective To translate the Nurses' Work Values Scale (NWVS) and validate its reliability and validity among clinical nurses, providing a reliable tool for assessing nurses' work values in China.

Design A quantitative and cross-sectional design.

Methods On the basis of Brislin's translation model, the NWVS was translated, back-translated, synthesized, culturally adapted, and pilot tested to develop a Chinese version of the NWVS. Convenience sampling was used to select clinical nurses from three tertiary-level A hospitals in Jiangsu and Zhejiang from January to April 2024 to assess the reliability and validity of the Chinese version of the NWVS.

Results The Chinese version of the NWVS includes four factors with 30 items. The exploratory factor analysis extracted four common factors with eigenvalues > 1, and the cumulative variance contribution rate was 68.762%. Validated factor analysis revealed good model fit, with $\chi^2/df = 2.027$, RMSEA = 0.060, SRMR = 0.067, CFI = 0.911, TLI = 0.901, and IFI = 0.912; the item-level content validity index ranged from 0.875 to 1.000, and the scale-level content validity index/average was 0.933; the Cronbach's α coefficient for the scale was 0.921; the test-retest reliability was 0.942; and the split-half reliability was 0.653.

Conclusion The Chinese version of the Nurses' Work Values Scale has good reliability and validity in assessing the work values of Chinese nurses, making it a reliable tool.

Clinical trial number Not applicable.

Keywords Nurses, Work values, Reliability, Validity, Psychometry

*Correspondence: Yaling Ji jiyaling2022@163.com ¹Department of Oncology, Huai'an Second People's Hospital, The Affiliated Huai'an Hospital of Xuzhou Medical University, Huai'an, Jiangsu 223002, China ²Department of Nursing, Huaian Hospital of Huaian City, 19 Shanyang Avenue, Huaian, Jiangsu 223200, China

© The Author(s) 2025. **Open Access** T



 ³Huai'an Second People's Hospital, The Affiliated Huai'an Hospital of Xuzhou Medical University, Huai'an, Jiangsu 223002, China
 ⁴School of Nursing, Dalian University, No.24 Luxun Road, Zhongshan District, Dalian City, Liaoning 116001, China
 ⁵Intensive Care Unit, Taizhou Hospital of Zhejiang Province Affiliated with Wenzhou Medical University, Zhejiang, China

© The Author(s) 2025. **Open Access** This article is licensed under a Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International License, which permits any non-commercial use, sharing, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons licence, and indicate if you modified the licensed material. You do not have permission under this licence to share adapted material derived from this article or parts of it. The images or other third party material in this article are included in the article's Creative Commons licence, unless indicated otherwise in a credit line to the material. If material is not included in the article's Creative Commons licence and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder. To view a copy of this licence, visit http://creative.commons.org/licenses/by-nc-nd/4.0/.

Background

Nurses play an indispensable role in the healthcare system, and their work is wide ranging, ranging from basic patient care to assisting doctors in complex medical operations, fully demonstrating the versatility of the nursing profession [1]. As society's requirements for healthcare quality and service levels are increasingly rising, the role and contribution of nurses are becoming increasingly significant. In recent decades, recognizing nurses' work values has become crucial, acknowledging their hard work, dedication, and critical role in healthcare [2]. However, nurses face many pressures and challenges in their work, such as intense workload, physical stress, and posttraumatic psychological problems [3, 4]. Therefore, it has become particularly important and urgent to conduct in-depth research on nurses' work values to gain a more comprehensive understanding of the various contexts they face during their careers and to provide opportunities for support and improvement.

In the field of nursing, work values significantly affect the work attitudes and motivation of nursing staff [5]. Nurses' work values, as the core drivers of nursing staff's career, profoundly reflect an individual's comprehensive knowledge of the nursing profession, positive attitudes, and the pursuit and aspiration of nursing career goals [6]. This value not only guides caregivers' behavioral decisions but is also closely related to key factors such as burnout and job satisfaction [7, 8]. Its importance lies in helping nursing staff understand their professional orientation and professional missions, stimulating intrinsic motivation, and making them more focused and committed to nursing work. Meanwhile, nursing work values influence the career choices and long-term planning of nursing staff and have a profound impact on the work effectiveness of the whole nursing team. In addition, correct work values can help maintain professional ethics and norms, help nurses pay more attention to patients' rights and well-being, establish good doctor-patient relationships, and improve the quality of nursing services.

For decades, researchers have conducted extensive studies on work values, aiming to uncover the core values that individuals cherish in their professional lives [9, 10]. Various classification methods have been proposed by different researchers. Super [11] categorized work values into intrinsic values, extrinsic work values, and extrinsic rewards; Kalleberg [12] further subdivided them into economic benefits, resource adequacy, convenience, coworker relationships, intrinsic motivation, and career advancement opportunities; and Elizur [13] classified them into material values, cognitive values, and affective values. However, previous studies have often focused more on general work values, with insufficient attention given to work values specific to certain professions, such as nursing [14]. Additionally, the scales and concepts

used to measure nurses' work values have not been clearly defined, which has hindered the accurate assessment of work values among the nursing population. To fill this gap, Hara [15] developed the Nursing Work Value Scale (NWVS). This scale comprehensively evaluates nurses' intrinsic work values, extrinsic work values, social work values, and prestige work values. It has been validated among Japanese nurses and has demonstrated good reliability and validity.

Globally, nurses from different countries or regions may be influenced by varying cultural and value systems in their work, leading to differences in the understanding and emphasis of nurses' work values. To more accurately reflect the actual situation of Chinese nurses, this study translated the NWVS into Chinese and conducted crosscultural adaptation. This approach helps enhance the scale's reliability and accuracy. Additionally, by examining the psychometric properties of the C-NWVS within the Chinese nursing population, we further validated the scale's applicability and effectiveness in the Chinese cultural context. Therefore, this study hypothesizes that the content validity, construct validity, internal consistency, split-half reliability, and test-retest reliability of the C-NWVS are similar to those of the original scale.

Methods

Study design

A quantitative and cross-sectional study. The primary aim of this study was to validate the psychometric properties of the Chinese version of the Nursing Work Values Scale (C-NWVS). This study was conducted in two phases: (i) translation of the NWVS into Chinese and cross-cultural adaptation and (ii) validation of the psychometric properties of the C-NWVS (Fig. 1). Before implementation, the researchers provided all the participants with a detailed explanation of the study's content, objectives, and benefits of participating in the project. The participants were then asked to sign informed consent forms. They were also assured that their data would be anonymized and used solely for research purposes.

Participants

This study employed a convenience sampling method to survey clinical nurses from three tertiary hospitals in Jiangsu and Zhejiang Provinces between January and April 2024. While convenience sampling was used, efforts were made to ensure the sample's representativeness by surveying nurses from diverse clinical settings across two provinces. The inclusion criteria were as follows: (i) possession of a nursing practice license; (ii) at least six months of clinical nursing experience; and (iii) informed consent and voluntary participation in the study, provided in written form. The exclusion criteria were as follows: (i) interns, standardized training,



Fig. 1 Translation and psychometric flow chart of the C- NWVS

and advanced training nurses; and (ii) nurses on leave for personal reasons, maternity leave, or medical leave. Given the requirements of factor analysis, the sample size should be 10–20 times the number of items in the scale [16], with an exploratory factor analysis (EFA) sample size greater than 100 and a confirmatory factor analysis (CFA) sample size greater than 200 [17]. Accounting for a 10% invalid response rate [18], the calculated sample size was $n = (10 \sim 20) \times 30 \div (1-10\%) \approx 334 \sim 667$. Ultimately, 550 questionnaires were distributed, with 534 valid responses, yielding an effective response rate of 97.1%.

Study procedure

Translation and back-translation of the C-NWVS

After authorization from the original scale's author via email, we translated and back-translated the NWVS following Brislin's translation-back translation model [19]. (i) Direct translation: The NWVS was independently translated into Chinese by two translators, both proficient in Japanese and native Chinese speakers. One translator was a clinical nurse, and the other translator was an Japanese language teacher who was familiar with Chinese translation but without a medical background. Each translator produces versions A1 and A2. The research team then convened to discuss and reconcile the differences between the two versions, ultimately producing a unified Chinese version, A12. (ii) Back translation: Two translators, well versed in nursing and psychometrics and with overseas medical study experience, independently back-translated A12 into Japanese. One translator was a clinical nurse with exchange experience in Japan, and the other translator was a Japanese medical student. This step produced two back-translated versions, B1 and B2. (iii) Synthesis: Two nursing PhDs compared B1, B2, and the original scale, synthesizing them into a consolidated back-translated version, B12. Finally, the research team adjusted the scale items to align with the Chinese cultural context and language conventions, resulting in the final Chinese version, T1.

Cultural adaptation of the C-NWVS

In this study, eight experts from the fields of clinical nursing, nursing education, and scale development were invited to make cultural adjustments to the questionnaire. The selection criteria for the experts were as follows: (1) had an associate senior title and above; (2) had a bachelor's degree or above; and (3) had more than ten years of clinical nursing experience. Relying on professional theoretical knowledge and rich clinical experience, these eight experts evaluated the language articulation, content relevance, and cultural background applicability of the scale [18]. They assessed each item via a 4-point Likert scale, where 1 indicates no correlation, 2 indicates a weak correlation, 3 indicates a strong correlation, and 4 indicates a strong correlation. The relevant items of the scale are adjusted on the basis of the experts' suggestions. The final adjustment suggestions include amending "To grow as a person" in item 5 to "As a person, you need to grow up;" and "increasing one's experience as a nurse" in item 6 to "increasing one's own work experience." These revisions were primarily based on the understanding of the domestic nursing staff regarding the content of the items. In accordance with the results of cross-cultural adaptation, the Chinese version T2 was developed.

Pilot testing of the C-NWVS

A convenience sampling method was used to select 30 clinical nurses for the pilot test to collect their feedback on the time required for the scale assessment, the clarity of the instructions, the level of understanding of the items, and the presence of ambiguity [18]. On the basis of the pilot testing feedback, the content of the items that were semantically ambiguous and poorly expressed was corrected again. The final adjustments included changing the word "staff" to "colleague" in items 19, 22, and 26. The final Chinese version of the T3 was developed on the basis of the results of the pilot test.

Measures

General information questionnaire

The demographic questionnaire included age, years of nursing experience, gender, professional title, education, marital status, religion, clinical unit, position, employment and number of night shifts per month.

NWVS

The NWVS was developed by Hara [15] to assess the work values of clinical nurses. The scale consists of four factors: intrinsic work values (9 items), extrinsic work values (6 items), social work values (10 items), and prestige work values (5 items), totaling 30 items. A 5-point Likert scale ranging from "not at all important" to "very important," with total scores ranging from 30 to 150,

with higher scores indicating higher work values among nurses, was used.

Data analysis

Data entry and analysis were conducted via SPSS 25.0 and AMOS 24.0 software. Quantitative data are presented as frequencies and percentages, while quantitative data conforming to a normal distribution are expressed as the means ± standard deviations.

Item analysis

Item analysis was conducted via the correlation coefficient method and critical ratio (CR) method. The participants were ranked according to their scores, with the top and bottom 27% of individuals categorized into highscore and low-score groups, respectively. An independent samples t test was then performed to compare the mean differences of each item between these two groups. The criteria for item deletion included (i) no statistically significant difference in scores between the two extreme groups (P>0.05) and (ii) the correlation coefficient between the item and the total scale score being statistically insignificant (P>0.05) or the correlation coefficient being less than 0.3 [20].

Reliability

Reliability analysis was conducted on the basis of internal consistency, split-half reliability, and test-retest reliability. The internal consistency of the scale was assessed by calculating Cronbach's α coefficient, with a Cronbach's α value greater than 0.70 indicating good internal consistency reliability [21]. Split-half reliability was determined by dividing the items into two halves on the basis of odd and even numbers and calculating the correlation coefficient between the scores of these two halves. A split-half coefficient greater than 0.60 indicated reliable assessment results [22]. Test-retest reliability was evaluated by having 30 nurses, who were randomly selected from the overall sample, complete the questionnaire again after a two-week interval. The intraclass correlation coefficient (ICC) was used to assess the test-retest results, with a correlation coefficient greater than 0.7 indicating high consistency and good stability between the two measurements [23].

Validity

Validity analysis was conducted on the basis of content validity and construct validity. For content validity, eight experts were invited to evaluate the scale content via a 4-point Likert scale. The evaluation criteria included the scale-level content validity index/average (S-CVI/Ave) and item-level content validity index (I-CVI). When the I-CVI is ≥ 0.780 and the S-CVI/Ave is ≥ 0.800 at the scale, good content validity is indicated [24, 25]. For construct

validity, a simple random sampling method was used to divide the sample into two unbiased subsamples, A and B. Sample A underwent EFA via principal component analysis and varimax rotation. Adequacy for EFA was confirmed if the Kaiser–Meyer–Olkin (KMO) measure exceeded 0.8, and Bartlett's test of sphericity yielded a significant chi–square value (P < 0.001) [26]. The construct validity was considered adequate if the eigenvalues exceeded one, the cumulative variance reached at least 50%, the factor loadings were above 0.4, and each

Table 1 Demographic characteristics of the participants (n = 534)

Variable	N (%)	M (SD)
Age		31.37
Gender		(7.10)
Male	41 (7.7)	
Female	493 (92.3)	
Years of nursing experience		9.19
Religion		(7.74)
Yes	25 (4.7)	
No	509 (95.3)	
Educational		
College or below	133 (24.9)	
Bachelor	357 (66.9)	
Master	44 (8.2)	
Marital status		
Married	277 (51.9)	
Single	257 (48.1)	
Professional title		
Junior	336 (62.9)	
Intermediate	154 (28.8)	
Advanced	44 (8.2)	
Clinical unit		
Medical	127 (23.8)	
Surgical	113 (21.2)	
Emergency	27 (5.1)	
ICU	144 (27.0)	
Other	123 (23.0)	
Position		
Regular nurse	492 (92.1)	
Director, Deputy director, Head nurse, or Assistant head nurse	42 (7.9)	
Employment		
Contract system	282 (52.8)	
Labor dispatch	23 (4 3)	
Career establishment	229 (42 9)	
Number of night shifts per month		
None	61 (11.4)	
1–4	163 (30.5)	
5–8	220 (41.2)	
≥9	90 (16.9)	

Note: M: mean; SD: standard deviation

factor contained a minimum of three items [27]. Sample B underwent CFA via the maximum likelihood (ML) method, treating common factors as latent variables and the involved items as observed variables to construct a model. Fit indices, including χ^2 /df, the root mean square error of approximation (RMSEA), the standardized root mean square residual (SRMR), the comparative fit index (CFI), the Tucker-Lewis index (TLI), and the incremental fit index (IFI), were employed to further validate the scale's construct validity [28].

Results

Demographic characteristics of the participants

A total of 534 clinical nurses participated in this survey, as shown in Table 1. Their ages ranged from 21 to 54 years, with a mean age of 31.37 ± 7.16 years, and their average work experience was 9.19 ± 7.14 years. Among these participants, 493 were female (92.3%), 509 reported no religion (95.3%), 357 held a bachelor's degree (66.9%), 277 were married (51.9%), 336 held junior professional titles (62.9%), 144 worked in ICU clinical departments (27.0%), 492 held the position of general nurse (92.1%), 282 were contracted employees (52.8%), and 220 reported working 5–8 night shifts per month (41.2%).

Item analysis

The CR method results indicated CR values ranging from 8.355 to 17.646, indicating significant differences (P < 0.01) between the high-score and low-score groups and good discriminative ability among scale items. Pearson correlation analysis revealed correlations between individual items and the total score ranging from 0.396 to 0.728 (Table 2), indicating that each item was representative and effectively reflected the concepts measured by the scale. On the basis of the item analysis, all original scale items were retained.

Content validity

The C-NWVS demonstrated good content validity, with the I-CVI ranging from 0.875 to 1.000 and the S-CVI/ Ave of 0.933.

Construct validity

EFA

A random sample of 250 cases was selected for EFA. The KMO measure was 0.906, and Bartlett's test of sphericity yielded an approximate chi-square value of 6194.596 (P < 0.001). Using principal component analysis with varimax rotation, four factors with eigenvalues greater than one were extracted, explaining a cumulative variance of 68.762%. All item loadings exceeded 0.4. There were revisions in the assignment of some items of the Chinese version of the NWVS compared with the original scale: item 15 shifted from Factor 2 (extrinsic work values) to Factor

Table 2 Reliability and item-to-total correlation results of the C-NWVS (n = 534)

Items	Item-to-total correlation	Cronbach's α
F1: Intrinsic work value		0.960
ltem_1	0.548**	
ltem_2	0.587**	
Item_3	0.580**	
ltem_4	0.603**	
Item_5	0.604**	
ltem_6	0.568**	
ltem_7	0.521**	
ltem_8	0.605**	
ltem_9	0.563**	
F2: External work value		0.822
ltem_10	0.431**	
ltem_11	0.400**	
ltem_12	0.464**	
ltem_13	0.434**	
ltem_14	0.396**	
F3: Social work value		0.924
ltem_15	0.444**	
ltem_16	0.519**	
ltem_17	0.610**	
ltem_18	0.611**	
ltem_19	0.594**	
ltem_20	0.572**	
ltem_21	0.625**	
ltem_22	0.593**	
ltem_23	0.532**	
ltem_24	0.728**	
F4: Prestige work value		0.867
ltem_25	0.593**	
ltem_26	0.546**	
ltem_27	0.606**	
ltem_28	0.602**	
ltem_29	0.556**	
ltem_30	0.546**	
Overall scale		0.921

Note: **P<0.01

3 (social work values), and item 25 shifted from Factor 3 (social work values) to Factor 4 (prestige work values). See Table 3 for details.

CFA

The remaining 284 samples were subjected to CFA to validate the first-order four-factor model. The results initially indicated suboptimal fit indices for the model. Consequently, the initial model underwent six rounds of modifications based on modification indices (MI), which are as follows: e1 with e2, e3 with e4, e10 with e11, e16 with e17, e23 with e24, and e25 with e26 (see Fig. 2). Following these adjustments, the model demonstrated improved fit indices within acceptable ranges. See Table 4 for details.

Item	Factors			
	F1	F2	F3	F4
F1: Intrinsic work value				
1. Develop your own way of working	0.802			
2. Explore better nursing methods	0.862			
3. Being a nurse requires constant	0.891			
growth	0.051			
4. Improve nursing practice skills	0.894			
5. As a person, you need to grow up	0.880			
6. Take care of all kinds of patients to increase their work experience	0.841			
7. Pursue the things you are interested in	0.811			
8. Improve the professional skills of nurses	0.883			
9. Learn new knowledge and skills	0.849			
F2: External work value				
10. Get a higher salary		0.785		
11. Earn a higher salary than the aver-		0.719		
12. Work as a full-time employee rather than a temporary worker		0.675		
13 Guaranteed long-term employment		0.743		
14. Be able to work according to your		0.597		
favorite work mode, such as day shift or night shift, without changing your place of work		0.507		
F3: Social work value				
15 Contributing to society as a purse			0.823	
16 Holp people around the world			0.864	
through nursing work			0.004	
17. Provide assistance to employees of			0.861	
the same work unit			0.061	
18. Help patients by providing care			0.861	
19. Help colleagues by working in the			0.853	
same workplace			0.075	
team			0.075	
21. Support the training of junior nurses			0.857	
22. Establish a good working relation- ship with colleagues in the same			0.884	
22 Make friends through work			0015	
24. Connect with others through work			0.645	
			0.021	
F4: Prestige work value				
25. Become an influential person in the workplace				0.661
26. Highly respected by colleagues in the same workplace				0.747
27. The ability of nursing practice is				0.740
recognized by the superior				
28. As a nurse, be respected by others				0.737
29. Be highly respected by the patients				0.786
30. Be respected by junior nurses				0.778

Table 3 Factor loadings of the C- NWVS (n = 250)



Fig. 2 First-order four-factor model of the C- NWVS (n = 284). Note: F1: Intrinsic work value; F2: External work value; F3: Social work value; F4: Prestige work value

Reliability

The C-NWVS has a Cronbach's α coefficient of 0.921. The Cronbach's α coefficients for the four factors—intrinsic work values, extrinsic work values, social work values, and prestige work values—are 0.960, 0.863, 0.940, and 0.884, respectively. The total scale's split-half reliability coefficient is 0.653, with split-half reliabilities for the four factors being 0.942, 0.824, 0.917, and 0.860, respectively. The test-retest reliability of the total scale, measured by the ICC, is 0.942, and for the four factors, the ICC values

Fit indicators	X²/df	TLI	IFI	CFI	SRMR	RMSEA
Reference value	≤ 3.00	≥0.90	≥0.90	≥ 0.90	≤ 0.08	≤ 0.08
Initial model	2.618	0.845	0.859	0.858	0.072	0.076
Modified model	2.027	0.901	0.912	0.911	0.067	0.060

 Table 4
 C- NWVS confirmatory factor analysis model fitting results

Note: X²/df-chi-square distribution/degrees of freedom, TLI-Tucker-Lewis Index, IFI-Incremental Fit Index, CFI-comparative fit index, SRMR-Standardized Root Mean Square Residual, RMSEA-Root Mean Square Error of Approximation

are 0.938, 0.903, 0.891, and 0.905, which are statistically significant (P < 0.001).

Discussion

This study meticulously adhered to the procedures for scale localization, standard translation methods, and cultural adaptation guidelines to ensure that the C-NWVS is equivalent to the original scale in terms of concepts and semantics, thus guaranteeing the rigor and scientific accuracy of the translation process [29-31]. After the modification process, experts reached a consensus on the wording, applicability, cultural context, and semantic consistency of the C-NWVS. Survey respondents reported that the items were clearly expressed, intuitive, easy to understand, and reasonably structured, facilitating comprehension and answering. This effectively addressed the problem of comprehension differences and cultural adaptation in the Chineseization of the scale. To the best of our knowledge, this is the first specific scale available for assessing the work values of clinical nurses in China. The scale provides a basis for an in-depth study of the current status of clinical nurses' work value for multinational comparisons, which is highly important for improving the quality of nursing care, optimizing nursing management, and promoting the development of the nursing discipline. Moreover, the scale can serve as an important reference index for nurses' career development, motivating them to improve their professional skills and service quality.

The quality of research instruments is crucial for ensuring the accuracy and reliability of study data, with reliability and validity being the core indicators for measuring the quality of these tools [32]. In this study, we focused particularly on the assessment of the scale's validity, using both content validity and construct validity as evaluation criteria. The results indicated that the I-CVI of the C-NWVS ranged from 0.875 to 1.000, and the S-CVI/Ave was 0.933, demonstrating that the scale possesses good content validity and can accurately reflect the measured content [24, 25].

The EFA results revealed that although the number of extracted factors remained consistent with the original scale, there were some differences in the item assignments within certain factors. Specifically, item 15, "Contributing to society as a nurse," which was originally categorized under extrinsic work values, was reclassified under social work values in this analysis. This shift may be due to the emphasis on the overall contribution of nursing work to society rather than just to external work conditions or the environment. Therefore, it aligns more closely with the definition of social work values, which pertain to the impact and value of work on society. Additionally, item 25, "Becoming an influential person in the workplace," was originally a social work value but was reclassified under prestige work values in this EFA. This change might stem from the fact that in a workplace context, influence is often associated with personal prestige, status, and recognition by others. Although social work values include expectations of individual contributions and influence on society, such influence typically refers to a broader societal impact. However, in a workplace setting, becoming influential usually implies having high prestige and status within a specific field or team, directly enhancing work efficiency, team collaboration, and personal career development. This adjustment makes the scale more accurately reflect the nuanced differences between different factors. The CFA results indicated that the initial model's fit was suboptimal. Given these results, we applied modifications and adjustments to the initial model on the basis of MI. After these revisions, all fit indices met the expected reference ranges, indicating that the modified C-NWVS model had a good fit [28].

Further research results indicate that the Cronbach's α coefficient for the C-NWVS is 0.921, with the coefficients for each factor ranging from 0.863 to 0.960. These results surpass Hara's [15] validation results for the Japanese version of the NWVS, demonstrating that the C-NWVS possesses excellent internal consistency. However, the split-half coefficient for the overall scale is 0.653, whereas the split-half reliability for the four factors ranges from 0.824 to 0.942. The lower split-half reliability for the overall scale, compared with the higher reliability for individual subscales, may be attributed to the complexity of the scale's structure and its first application to the Chinese clinical nurse population. The overall scale encompasses multiple factors, potentially leading to internal structural differences when diverse concepts are measured, thereby resulting in lower overall split-half reliability. Conversely, the individual factors focused on specific concepts and closely aligned with the practical context of the Chinese clinical nurse population, which exhibited higher splithalf reliability. Additionally, the C-NWVS demonstrates

robust temporal stability, with a test-retest reliability of 0.942 after two weeks, further confirming the scale's reliability over time [23].

In recent years, the world has faced the challenges of a severely aging population and continuous growth in the number of patients with chronic diseases, leading to the pressing problem of the prevalence of nursing shortages in various countries [33, 34]. In this context, stabilizing the existing nursing workforce and attracting and retaining excellent nursing talent have become crucial issues for nursing managers. Studies have shown [35] that enhancing nursing staff's sense of professional achievement and work value can significantly increase their sense of professional responsibility and work loyalty. This self-efficacy-driven incentive mechanism is crucial for promoting the full implementation of quality nursing services. Therefore, nursing managers should strive to create a work environment where nurses can deeply perceive the value of their work and inspire their inner passion, thus ensuring the continuous improvement of nursing service quality and the stable development of the nursing workforce [36].

The C-NWVS comprehensively evaluates nurses' values in clinical practice through four factors: intrinsic work value, extrinsic work value, social work value, and prestige work value. First, intrinsic work value emphasizes nurses' sense of recognition and satisfaction with their work, which helps stimulate their enthusiasm and positivity, thereby enabling them to provide high-quality care to patients with a greater focus [14]. Understanding nurses' intrinsic work values allows hospitals and nursing managers to better address nurses' personal needs and development, providing the necessary support and resources to promote the stability and growth of the nursing workforce. Second, extrinsic work value focuses on nurses' needs for the work environment, compensation, and career development. By assessing nurses' extrinsic work values, hospitals can optimize the allocation of nursing resources and improve nurses' job satisfaction and loyalty, thereby ensuring the continuity and quality of nursing services. Third, social work values reflect nurses' roles and responsibilities in society. Nurses are not only crucial members of healthcare teams but also key promoters of public health and social well-being [33]. Emphasizing nurses' social work values can encourage their active participation in social welfare activities, enhance public recognition and respect for the nursing profession, and foster a more harmonious patientcaregiver relationship and social environment. Finally, prestige work value reflects the status and reputation of the nursing profession in society. With the increasing demand for high-quality healthcare services, nurses' roles within healthcare teams have become increasingly significant [37]. By increasing nurses' prestige work values, more talented individuals can be attracted to the nursing profession, increasing the professional standards and competitiveness of the entire industry.

Limitations

This study has two main limitations. First, the survey participants were primarily from three hospitals in Jiangsu and Zhejiang Provinces, making the sample somewhat homogeneous. To address this limitation, future research should consider nationwide sampling to more comprehensively assess the applicability and reliability of the scale across diverse regions. This broader sampling would enhance the generalizability of the findings. Second, while we established the first-order four-factor structure of the Chinese version of the NWVS, we found discrepancies in the composition of items within certain factors compared with the original scale. This discrepancy will require further validation in future studies.

Conclusion

This study strictly followed the process of scale translation, reliability, and validity testing for NWVSs. The C-NWVS consists of four factors and 30 items, demonstrating robust psychometric properties. It serves as a reliable measurement tool for assessing the work values of nurses in China.

Abbreviations

NWVS	Nurses' work values scale
CR	Critical ratio
ICC	Intraclass correlation coefficient
S-CVI	Scale-level content validity index
I-CVI	Item-level content validity index
КМО	Kaiser–Meyer–Olkin
EFA	Exploratory factor analysis
CFA	Confirmatory factor analysis
ML	Maximum likelihood
RMSEA	Root mean square error of approximation
CFI	Comparative fit index
IFI	Incremental fit index
TLI	Tucker–Lewis index
SRMR	Standardized root mean square residual

Acknowledgements

The authors sincerely appreciate all 534 Chinese registered nurses for their participation in our questionnaire survey.

Author contributions

YW performed the statistical analysis and wrote the paper; XW collaborated on the study and revised the manuscript; YW and YJ made substantial contributions to the study conception and design; YW, YJ and TJ contributed to the data collection; and YJ and MB designed and revised the manuscript. The author(s) read and approved the final manuscript.

Funding

There is no funding for this study.

Data availability

The datasets used and analyzed in this study are available from the corresponding author upon reasonable request.

Declarations

Ethics approval and consent to participate

This study was approved by the ethics committee of Taizhou Hospital of Zhejiang Province (approval number: KL20231006), and all procedures were conducted in accordance with the Declaration of Helsinki. All the participants provided informed consent.

Consent for publication

Not applicable.

Competing interests

The authors declare no competing interests.

Received: 16 October 2024 / Accepted: 5 May 2025 Published online: 14 May 2025

References

- Wilson RL, Atem JM, Gumuskaya O, Lavadas M, Šošić B, Urek M. A call for nurses and interdisciplinary collaborators to urgently respond to the health and well-being needs of refugees across the world. J Adv Nurs. 2022;78(3):e52–61. https://doi.org/10.1111/jan.15134.
- Kim E, Kim H, Lee T. How are new nurses satisfied with their jobs? From the work value perspective of generations Y and Z nurses. BMC Nurs. 2024;23(1):252. https://doi.org/10.1186/s12912-024-01928-7.
- Li TM, Pien LC, Kao CC, Kubo T, Cheng WJ. Effects of work conditions and organisational strategies on nurses' mental health during the COVID-19 pandemic. JJ Nurs Manag. 2022;30(1):71–8. https://doi.org/10.1111/jonm.134 85.
- Zhang X, Zhang C, Gou J, Lee SY. The influence of psychosocial work environment, personal perceived health and job crafting on nurses' well-being: a cross-sectional survey study. BMC Nurs. 2024;23(1):373. https://doi.org/10.118 6/s12912-024-02041-5.
- Freeman M, Beaulieu L, Crawley J. Canadian nurse graduates considering migrating abroad for work: are their expectations being Met in Canada? Can J Nurs Res. 2015;47(4):80–96. https://doi.org/10.1177/084456211504700405.
- Hara Y, Asakura K. Concept analysis of nurses' work values. Nurs Forum. 2021;56(4):1029–37. https://doi.org/10.1111/nuf.12638.
- Saito Y, Igarashi A, Noguchi-Watanabe M, Takai Y, Yamamoto-Mitani N. Work values and their association with burnout/work engagement among nurses in long-term care hospitals. J Nurs Manag. 2018;26(4):393–402. https://doi.org /10.1111/jonm.12550.
- Wang KY, Chou CC, Lai JC. A structural model of total quality management, work values, job satisfaction and patient-safety-culture attitude among nurses. J Nurs Manag. 2019;27(2):225–32. https://doi.org/10.1111/jonm.1266 9.
- Fute A, Oubibi M, Sun B, Zhou Y, Xiao W. Work values predict job satisfaction among Chinese teachers during COVID-19: the mediation role of work engagement. Sustainability. 2022;14(3):1353. https://doi.org/10.3390/su1403 1353.
- Schwartz SH, Cieciuch J. Measuring the refined theory of individual values in 49 cultural groups: psychometrics of the revised portrait value questionnaire. Assessment. 2022;29(5):1005–19. https://doi.org/10.1177/107319112199876 0.
- 11. Super DE. Work values inventory: manual. Boston; 1970.
- 12. Kalleberg AL. Work values and job rewards: A theory of job satisfaction. Am Sociol Rev. 1977;42(1):124–43. https://doi.org/10.2307/2117735.
- 13. Elizur D. Facets of work values. A structural analysis of work outcomes. J Appl Psychol. 1984;69(3):379. https://doi.org/10.1037/0021-9010.69.3.379.
- Basinska BA, Dåderman AM. Work values of Police officers and their relationship with job burnout and work engagement. Front Psychol. 2019;10:442. htt ps://doi.org/10.3389/fpsyg.2019.00442.
- Hara Y, Asakura K, Yamada M, Takada N, Sugiyama S. Development and psychometric evaluation of the nurses' work values scale. Nurs Open. 2023;10(10):6957–71. https://doi.org/10.1002/nop2.1950.
- Myers ND, Ahn S, Jin Y. Sample size and power estimates for a confirmatory factor analytic model in exercise and sport: A Monte Carlo approach. Res Q Exerc Sport. 2011;82(3):412–23. https://doi.org/10.1080/02701367.2011.1059 9773.

- 17. Kline RB. Principles and practice of structural equation modeling. Guilford; 2023.
- Wang Y, Li S, Zou X, Xu L, Ni Y. Cross-cultural adaptation and validation of the Chinese version of the loneliness scale for older adults. Geriatr Nurs. 2022;48:190–6. https://doi.org/10.1016/j.gerinurse.2022.10.004.
- Brislin RW. Comparative research methodology: Cross-cultural studies. Int J Psychol. 1976;11(3):215–29. https://doi.org/10.1080/00207597608247359.
- Galiana L, Sánchez-Ruiz J, Gómez-Salgado J, Larkin PJ, Sansó N. Validation of the Spanish version of the five-item general Self-Efficacy (GSE) scale in a sample of nursing students: evidence of validity, reliability, longitudinal invariance and changes in general self-efficacy and resilience in a two-wave cross-lagged panel model. Nurse Educ Pract. 2024;74:103865. https://doi.org/ 10.1016/j.nepr.2023.103865.
- 21. Streiner DL, Norman GR, Cairney J. Health measurement scales: a practical guide to their development and use. Oxford University Press; 2024.
- Wang Y, Jiang T, Shen L. Cross-cultural adaptation and validation of the Chinese version of the intensive care oral care frequency and assessment scale. Heliyon. 2024;10(1):e24025. https://doi.org/10.1016/j.heliyon.2024.e24025.
- Cakmur H. Measurement-reliability-validity in research. TAF Prev Med Bull. 2012;11:339–44. https://doi.org/10.5455/pmb.1-1322486024.
- 24. Polit DF, Beck CT. The content validity index: are you sure you know what's being reported? Critique and recommendations. Res Nurs Health. 2006;29(5):489–97. https://doi.org/10.1002/nur.20147.
- Yaghmaie F. Content validity and its Estimation. J Med EdU. 2003;3(1):e105015. https://doi.org/10.22037/jme.v3i1.870.
- Williams B, Onsman A, Brown T. Exploratory factor analysis: A five-step guide for novices. Australasian J Paramedicine. 2010;8:1–13. https://doi.org/10.3315 1/ajp.8.3.93.
- 27. Shrestha N. Factor analysis as a tool for survey analysis. Am J Appl Math Stat. 2021;9(1):4–11. https://doi.org/10.12691/ajams-9-1-2.
- Perry JL, Nicholls AR, Clough PJ, Crust L. Assessing model fit: caveats and recommendations for confirmatory factor analysis and exploratory structural equation modeling. Meas Phys Educ Exerc Sci. 2015;19(1):12–21. https://doi.o rg/10.1080/1091367x.2014.952370.
- Peña ED. Lost in translation: methodological considerations in cross-cultural research. Child Dev. 2007;78(4):1255–64. https://doi.org/10.1111/j.1467-8624. 2007.01064.x.
- Yang Z, Wang H, Wang A. Development and validation of the advance care planning practice preference scale for clinical nurses. J Adv Nurs. 2023;79(7):2695–08. https://doi.org/10.1111/jan.15641.
- Yang Z, Sun Y, Wang H, Zhang C, Wang A. A scale for measuring home-based cardiac rehabilitation exercise adherence: a development and validation study. BMC Nurs. 2023;22(1):259. https://doi.org/10.1186/s12912-023-0142 6-2.
- Li S, Hou S, Deng X, Chen S, Wang H, Tang L, Ye M, Xie J. Reliability and validity assessment of the Chinese version of the intrahospital transport safety scale (IHTSS) in intensive care units. BMC Nurs. 2024;23(1):296. https://doi.org/10.11 86/s12912-024-01906-z.
- Marć M, Bartosiewicz A, Burzyńska J, Chmiel Z, Januszewicz P. A nursing shortage–a prospect of global and local policies. Int Nurs Rev. 2019;66(1):9– 16. https://doi.org/10.1111/inr.12473.
- Nevidjon B, Erickson JI. The nursing shortage: solutions for the short and long term. Online J Issues Nurs. 2001;6(1):461–72. https://doi.org/10.1590/S0104-1 1692002000300013.
- McNeese-Smith DK, Crook M. Nursing values and a changing nurse workforce: values, age, and job stages. J Nurs Adm. 2003;33(5):260–70. https://doi. org/10.1097/00005110-200305000-00002.
- Shirey MR. Authentic leaders creating healthy work environments for nursing practice. Am J Crit Care. 2006;15(3):256–67. https://doi.org/10.4037/ajcc2006. 15.3.256.
- 37. Aydogdu ALF. Interpersonal relationships of the nursing team in the work environment according to nursing students: A qualitative study. Nurse Educ. 2024;74:103861. https://doi.org/10.1016/j.nepr.2023.103861.

Publisher's note

Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.