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Original Article

Psychometric Testing of the Thai Version of the Short-Form Practice Environment Scale of the Nursing Work Index Among Nurses Within the Thai Social Context

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Abstract

Background: A standardized assessment of the nursing practice environment is essential as a foundation for planning and implementing improvements that enhance the suitability and efficiency of nurses' work settings. While comprehensive evaluations provide valuable insights, they can be resource-intensive, particularly in settings with limited capacity. The Practice Environment Scale of the Nursing Work Index (PES-NWI) is a widely validated instrument for assessing nursing work environments, and its short-form version, the PES-5, was developed to reduce respondent burden. Adapting the PES-5 to the Thai context ensures cultural and organizational appropriateness, thereby enhancing its applicability and utility in Thai healthcare settings.

Objectives: To translate the PES-5 into Thai and assess its psychometric properties among Thai nurses.

Methods: A cross-sectional design was employed. The PES-5 was translated into Thai using a systematic forward and backward translation process to ensure conceptual and linguistic equivalence. Data were collected from 250 full-time registered nurses working in public hospitals under Thailand's Ministry of Public Health via an online survey. Psychometric evaluation was conducted using Rasch model analysis, performed with Jamovi software (version 2.6.26). Internal consistency was assessed using Cronbach α and item-total correlation. Rasch analysis was used to examine item fit, response category functioning, and person separation reliability.

Results: The Thai version (T-PES-5) demonstrated excellent content validity (S-CVI = 1.00). Rasch analysis showed acceptable Infit and Outfit statistics (0.81-1.24 and 0.79-1.31, respectively), indicating good item fit. Cronbach α was 0.73, reflecting satisfactory internal consistency. The Wright map revealed a well-balanced item difficulty distribution with no evidence of floor or ceiling effects.

Conclusions: The T-PES-5 is a psychometrically sound instrument for evaluating the nursing practice environment in Thailand. Its brevity and validity make it particularly suitable for large-scale assessments in public healthcare settings, supporting efforts to improve work environments and, ultimately, patient care quality.

Keywords: Nurses, Practice Environment Scale of the Nursing Work Index, Validation, Psychometric properties

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Introduction

The global shortage of nurses is a critical issue affecting healthcare systems worldwide. Countries such as the US, Japan, Australia, and several in Europe have reported increasing difficulty in maintaining an adequate nursing workforce.[1, 2] Thailand, similarly, faces a shortage that significantly affects healthcare delivery.[3] Among the many factors influencing nurse retention, the nursing practice environment has been recognized as one of the most influential.[4, 5] A supportive work environment contributes to improved nurse satisfaction, reduced turnover, and better patient care outcomes.[6, 7]

Lake[8] defined the nursing practice environment as 'the organizational characteristics of a work setting that facilitate or constrain professional nursing practice'. To assess this construct, Lake[8] developed the Practice Environment Scale of the Nursing Work Index (PES-NWI), which evolved from the original Nursing Work Index. The PES-NWI has been extensively validated and widely used in many countries and contexts. It includes 31 items grouped into 5 subscales that address key organizational dimensions related to nursing practice.[8-10]

The 5 subscales of the PES-NWI are: 1) nurse participation in hospital affairs, which assesses the degree to which nurses are involved in institutional governance-for example, through participation in decision-making processes, serving on hospital committees, or contributing to policy development; 2) nursing foundations for quality of care, which evaluates the presence of care standards, professional development opportunities, and evidence-based practice guidelines that support high-quality nursing care; 3) nurse manager ability, leadership, and support, which focuses on the supervisory role of nurse managers, including leadership effectiveness, support for staff, and advocacy for nursing concerns; 4) staffing and resource adequacy, which measures whether staffing levels and resources are sufficient to meet patient care demands and support safe practice; and 5) collegial nurse-physician relations, which examines the quality of interprofessional collaboration and mutual respect between nurses and physicians.[8-10] These subscales collectively offer a comprehensive assessment of the organizational environment in which nurses deliver care.

Although the PES-NWI has demonstrated robust psychometric properties and cross-cultural validity, having been translated into more than 24 languages and used in over 35 countries, its length has been a noted limitation.[11-13] In Thailand, the full 31-item version has been translated and used in several studies,[14] but researchers have reported that the instrument's length can lead to survey fatigue, decreased response rates, and potential item redundancy.[13, 15] These limitations have practical implications, particularly when administered in clinical settings where nurses face time constraints.

To address these concerns, Lake et al[10] developed a short-form version of the instrument known as the PES-5. This concise version includes 5 representative items, one from each subscale, allowing for a quicker yet effective assessment of the nursing practice environment. Despite its proven utility in other international contexts, the PES-5 has not been adapted or validated in Thailand. Given the limitations identified in previous Thai studies and the growing need for efficient and contextually appropriate tools, the present study aimed to translate the PES-5 into Thai and evaluate its psychometric properties among Thai nurses working in government hospitals. The objective was to translate the PES-5 into Thai (T-PES-5) and assess its psychometric properties among nurses in Thailand.

Methods

Study Design

This study employed a quantitative, cross-sectional design, incorporating Rasch model analysis to evaluate the measurement properties of the instrument. Data collection was purposefully focused on tertiary government hospitals, as these institutions provide highly complex nursing practice environments that offer richer insights into specialized roles, advanced patient care, and organizational structures compared to primary and secondary hospitals. Such complexity includes higher patient acuity levels, specialized nursing roles, and advanced healthcare resources. Limiting the sample to tertiary settings thus ensured the instrument's applicability and validity within the context most relevant to advanced nursing practice. This study obtained ethical approval from the Institute for the Development of Human Research Protections (IHRP), under the Health Systems Research Institute (HSRI). Permission to use and adapt the original PES-5 was granted by the scale's author. All procedures followed the Declaration of Helsinki. Participants received detailed study information and provided written informed consent. They were assured of voluntary participation, with the right to withdraw at any time. Confidentiality was strictly maintained, and findings were used solely for academic purposes.

Participants

A purposive-convenient sampling approach was employed to recruit full-time registered nurses who held at least a bachelor's degree in nursing and were currently employed at tertiary government hospitals. Nurses who were on maternity leave, extended sick leave, or study leave at the time of data collection were excluded to ensure that participants were actively engaged in their work environments. This sampling strategy was selected due to logistical constraints and the need for timely data collection, as it allowed efficient access to eligible participants within the targeted institutions. Participants were recruited from 35 tertiary government hospitals located across Thailand's 5 major geographic regions — North, Central, Eastern, Northeastern, and Southern in order to enhance geographic diversity and reflect variation in healthcare delivery contexts. The selected hospitals represented a range of institutional sizes and service capacities typically found in the public tertiary care system. The proportion of participants recruited from each hospital ranged from 15% to 25%, resulting in a balanced distribution of the nursing workforce across sites and improving the representativeness of the sample within the public healthcare sector. Based on the guidelines of Smith et al,[16] a sample size between 250 and 500 was considered optimal for Rasch analysis of a well-targeted scale. In this study, 250 nurses were included.

Instruments

Two instruments were utilized in this study. Permission for their use and translation, where applicable, was obtained from the original authors. The first instrument was a demographic questionnaire developed by the primary investigator (PI) to collect information on participants' age, gender, marital status, educational background, nursing specialty training, work experience, monthly income, and employment status. The second instrument was the PES-5 which was assessed using the 5 items adapted from Lake et al.[10] This scale had been widely recognized for its validity and reliability in measuring the nurse practice environment. The original scale demonstrated strong internal consistency, with a Cronbach α of 0.94.[10] The items were assessed on a 4-point Likert scale,

with '1' indicating 'strongly disagree' and '4' indicating 'strongly agree'. The total score for the scale ranged from 1 to 4. A score above 2.5 typically reflected a positive work environment, while a score below 2.5 indicated a less favorable environment.[8, 10]

Translation of Instrument

The translation process of the PES-5 followed established and internationally recognized guidelines, specifically the back-translation method with bilingual testing as recommended by Beaton et al[17] and Curtis et al.[18] Initially, 2 bilingual translators including a linguistic expert and a clinical specialist who independently conducted forward translations from English to Thai. The researcher reviewed and reconciled the versions to ensure conceptual equivalence. A second draft was then evaluated by 2 additional experts, who were blinded to the original instrument to minimize bias. Subsequently, a back-translation from Thai to English was performed by an independent translator. The back-translated version was compared with the original to confirm linguistic and conceptual consistency. Through iterative discussions among the translators, experts, and researcher, discrepancies in wording and grammar were resolved, finalizing a Thai version that accurately reflected the original instrument's intent. This rigorous process ensured the translation's validity and cultural appropriateness for the target population.

Five experts, each holding a master's or PhD in Psychiatry or Nursing Science, evaluated the content validity of the T-PES-5. They rated each item on a 4-point scale (1 = not relevant, 2 = somewhat relevant, 3 = quite relevant, 4 = very relevant) and provided suggestions for clarification. The content validity index (CVI) was then calculated, with a score of 0.80 or higher deemed acceptable.[19] Both the scale-level content validity index (S-CVI) and the item-content validity index (I-CVI) of the T-PES-5 reached a perfect score of 1.00, indicating excellent content validity.

Data Collection

Data collection was conducted from 1 to 31 January 2025, using an online survey distributed through multiple channels, including official hospital announcements, email invitations with a secure Google Forms link, and QR codes posted within nursing units. The survey platform was configured to accept up to 250 responses, after which access was automatically closed to align with the predetermined sample size. Prior to participation, nurses reviewed study information and provided electronic informed consent. The survey required approximately 3 to 5 minutes to complete and participation was entirely voluntary. To ensure confidentiality and minimize response bias, no identifiable information — such as names, employee IDs, email addresses, or IP addresses — was collected, and all responses were submitted anonymously.

Statistical Analysis

The data were analyzed using SPSS version 29.0 (IBM SPSS Statistics for Windows, Version 29.0. Armonk, NY: IBM Corp; 2023). Descriptive statistics were applied to summarize the sample characteristics.[20, 21] To assess the scale's reliability, Cronbach α coefficient was calculated, with a value of 0.70 or higher being deemed acceptable.[22] The corrected item-total correlation was computed to measure the strength of each item's relationship with the total scale score, with values above 0.50 indicating a strong correlation, and those between 0.30 and 0.50 considered acceptable.[23]

Rasch analysis was performed using Jamovi version 2.6.26 and the snowIRT modules. Infit and outfit values between 0.60 and 1.40 were interpreted as indicating a good fit.[24, 25] Values below 0.60 or above 1.40 suggested item redundancy or poor alignment with the underlying construct, respectively. Chi-square probability values greater than the Bonferroni-adjusted 5% threshold confirmed adequate item fit.[24] Item characteristic curves (ICCs) were examined visually for item fit, and threshold ordering was evaluated both statistically and graphically to ensure the response categories functioned as expected.[24, 25]

Results

Descriptive Analysis

The study included 250 nurses, the majority of participants were female (89.20%), with mean (SD) age of 38.78 (10.84) years. Married individuals were the largest marital status group, comprising 48.80% of the sample. Regarding education, 84.40% held bachelor's degrees, and 58.00% had completed a nursing specialty course. The mean (SD) years of professional experience was 8.04 (6.87). Additionally, 36.00% of participants reported earning a monthly salary of at least ฿45 000. A significant proportion of participants (92.80%) were employed as government officers (Table 1).

The normality of the T-PES-5 was checked using skewness and kurtosis, which showed a slight negative skew which suggested the distribution was close to normal or slightly platykurtic (skewness = -0.14 to -0.72, kurtosis = -0.30 to 1.36). These findings indicated that the data's departure from normality was within an acceptable range.

To assess content validity, floor and ceiling effects were analyzed, with a threshold set at less than 15%. In this study, 1 participant scored the lowest possible total on the T-PES-5 (1.20 points), which represented 0.40% of the sample, while 3 participants reached the highest possible score (4.00 points), accounting for 1.2%. As the percentage of participants with either the lowest or highest scores remained well below 15% threshold, the instrument was determined to have good content validity.

The Rasch analyses were deemed appropriate, as the summary model indicated no significant difference between the observed data and the model expectations, thereby supporting a good overall fit (χ^2 = 20.62, *df* = 12, *P* = .06). The person separation reliability was 0.72 (*P* < .001), meeting the acceptable standard. The results of the Rasch analysis for the T-PES-5, showed infit values ranging from 0.81 to 1.24 and outfit values from 0.79 to 1.31, all of which were within the acceptable range (Table 2). These results indicated that the model fit was satisfactory and that the test reliably measured individual ability. The Wright map showed that items T-PES2, T-PES3, and T-PES5 had logit values below -3, which suggested they were easy for participants, while no items had logit values above 3 (Figure 1). This pattern aligned with the ICC, which showed a strong correlation between ability and the likelihood of answering items correctly, following an S-shaped curve. Comparisons the empirical and theoretical ICCs, demonstrated steepness of the curve, which reflected strong sensitivity in measuring individual ability (Figure 2). Finally, this confirmed the appropriate distribution of response categories across items (Figure 3).

Reliability

Cronbach α for the total scale score was 0.73, demonstrating strong internal consistency. When individual items were removed, the alpha values ranged from 0.65 to 0.75.

Furthermore, all item-total correlations were positive, ranging from 0.34 to 0.60, exceeding the 0.30 threshold, which indicated that each item made a positive contribution to the scale's overall consistency (Table 3).

Table 1. Demographic Characteristics of Participants

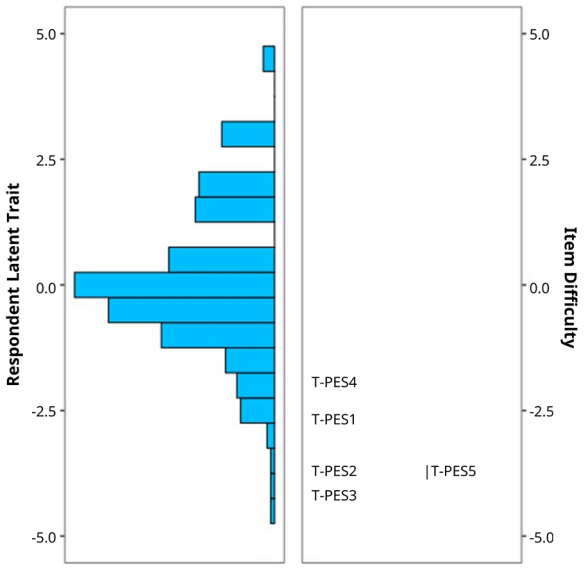
Characteristic	No. (%)
Age, mean (SD), y	38.78 (10.84)
Gender	
Male	27 (10.80)
Female	223 (89.20)
Marital status	
Single	114 (45.60)
Married	122 (48.80)
Other (divorced, widowed)	14 (5.60)
Education	
Bachelor's degree	211 (84.40)
Master's degree	39 (15.60)
Nursing specialty course	
No	105 (42.00)
Yes	145 (58.00)
Work experience, mean (SD), y	8.04 (6.87)
Salary per month, ฿	
15 000-29 999	86 (34.40)
30 000-44 999	74 (29.60)
≥ 45 000	90 (36.00)
Employment status	
Government officers	232 (92.80)
Nongovernment officers	18 (7.20)

Table 2. Item Statistics and Tau-Parameters for the T-PES-5

Item	Measure of Item Difficulty	SE	Infit	Outfit	Tau-Parameter			
					1	2	3	4
T-PES1	-2.74	0.11	1.03	1.05	-28.98	7.58	8.94	12.47
T-PES2	-3.67	0.12	1.09	1.05	-28.65	8.07	8.65	11.93
T-PES3	-4.06	0.12	0.82	0.81	-26.95	7.16	7.92	11.87
T-PES4	-1.79	0.10	1.24	1.31	-29.76	7.75	9.55	12.46
T-PES5	-3.78	0.12	0.81	0.79	-27.50	7.16	7.95	12.39

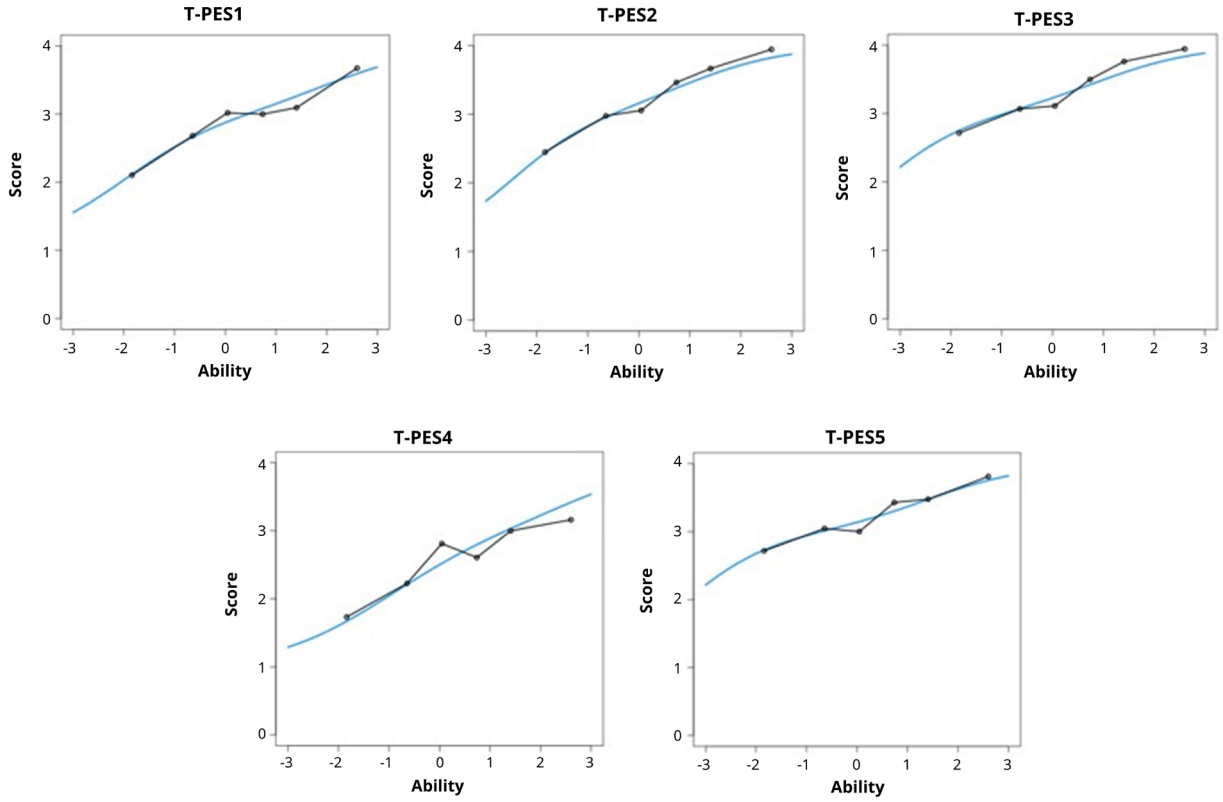
Abbreviations: SE, standard error; T-PES-5, Thai version of the short-form Practice Environment Scale of the Nursing Work Index.

Figure 1. Wright Map (Person-Item Map) of the T-PES-5



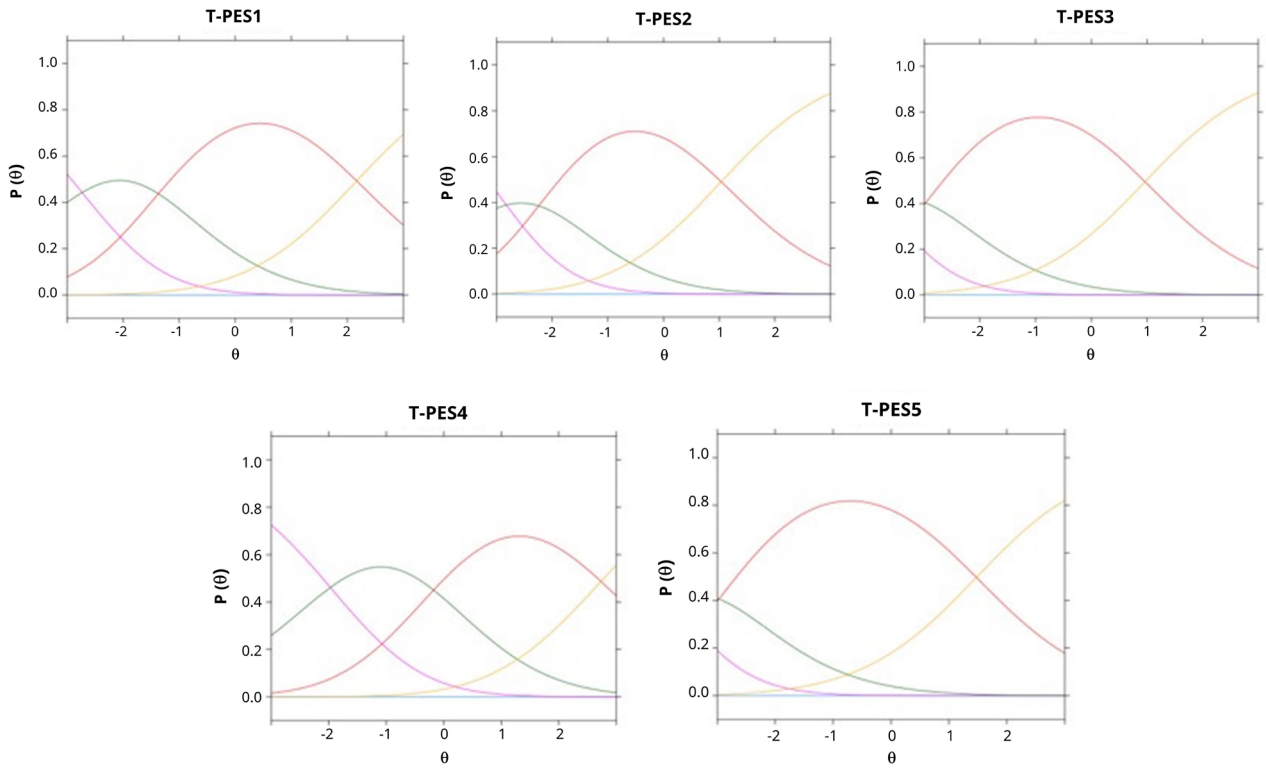
Abbreviation: T-PES-5, Thai version of the short-form Practice Environment Scale of the Nursing Work Index.

Figure 2. Item Characteristic Curve of the T-PES-5



Abbreviation: T-PES-5, Thai version of the short-form Practice Environment Scale of the Nursing Work Index.

Figure 3. Response Option Characteristic Curves for the Items of the T-PES-5



Abbreviation: T-PES-5, Thai version of the short-form Practice Environment Scale of the Nursing Work Index.

Table 3. The Reliability of the T-PES-5

Item	Mean (SD)	Corrected Item-Total Correlation	Cronbach α If Item Deleted
T-PES1	2.82 (0.74)	0.49	0.69
T-PES2	3.11 (0.74)	0.58	0.65
T-PES3	3.22 (0.62)	0.60	0.65
T-PES4	2.46 (0.83)	0.34	0.75
T-PES5	3.14 (0.59)	0.51	0.68

Abbreviation: T-PES-5, Thai version of the short-form Practice Environment Scale of the Nursing Work Index.

Discussion

This study was the first to apply Rasch analysis to assess the psychometric properties of the T-PES-5, offering both statistical rigor and practical relevance. The results demonstrated that the T-PES-5 is a psychometrically robust instrument, displaying unidimensionality, acceptable item fit, internal consistency, and person separation reliability. These findings support its validity as a brief, yet effective tool for evaluating the professional practice environment among Thai nurses.

The application of Rasch modeling adds methodological strength to the validation process. The nonsignificant chi-square statistic (χ^2 = 20.62, *df* = 12, *P* = .06) reflects a good

overall model fit, consistent with Rasch model expectations and prior validation studies.[26] Infit and outfit mean square values, which fell within acceptable ranges (infit, 0.81-1.24; outfit, 0.79-1.31), suggested that all 5 items performed in line with theoretical expectations, indicating strong item-level functioning and contributing to measurement precision.[24, 25]

The Wright map analysis further illustrated that the scale captured a wide range of respondent abilities. Items such as T-PES2, T-PES3, and T-PES5 were found to be easier for respondents to endorse, reflecting sensitivity at the lower end of the ability distribution.[22, 23] The absence of items with extreme difficulty ensured that the scale avoided floor and ceiling effects, thereby increasing its versatility for use across diverse nursing populations.

The ICCs supported the expected S-shaped form, indicating that items performed predictably in relation to respondents' latent trait levels.[27, 28] The steep slopes of the ICCs underscored the scale's ability to differentiate among varying levels of perceived practice environment quality, which is an essential feature for any instrument intended for both assessment and monitoring purposes.

The T-PES-5 also demonstrated acceptable internal consistency, with a Cronbach α of 0.73, meeting widely accepted benchmarks for reliability in social science research.[29, 30] Positive item-total correlations, and a stable alpha when individual items were excluded further reinforced the scale's internal coherence and unidimensional structure.

Beyond its psychometric performance, the T-PES-5 offers distinct practical advantages in the context of the Thai healthcare system. With only 5 items, the scale is well-suited for use in high-demand clinical settings where time and personnel resources are limited.[10] The brevity of the instrument reduces respondent burden, making it feasible for routine deployment without compromising measurement quality.

Equally important, the T-PES-5 was adapted with careful consideration of cultural nuances relevant to the Thai nursing context. Factors such as hierarchical work structures, collectivist organizational culture, and interpersonal dynamics influence how nurses experience their practice environment.[31, 32] The content and wording of the scale were refined to reflect these cultural realities, enhancing its face validity and acceptability among Thai nurses. This cultural alignment strengthens the instrument's utility, not only for measurement, but also for promoting engagement and trust in the evaluation process.[33]

In practical terms, the validated T-PES-5 equips hospital administrators, nursing leaders, and policymakers with a reliable and efficient tool to assess and monitor the quality of the nursing practice environment. Such assessments can guide targeted interventions aimed at improving nurse satisfaction, reducing turnover, and fostering environments conducive to high-quality patient care.[34, 35] Given the rising complexity of care and the ongoing challenges of nurse staffing in Thailand, the T-PES-5 represents a timely and actionable contribution to workforce development and health system strengthening.

In summary, the T-PES-5 is not only a psychometrically sound instrument, but also a culturally relevant and practically viable tool. Its validated short-form structure supports efficient, meaningful, and context-sensitive assessments of the nursing work environment. The integration of this instrument into research and practice may support system-level improvements, contributing to a stronger, more resilient nursing workforce and better patient care outcomes in the Thai healthcare system.

This study had key limitations. The instrument was developed and validated exclusively among nurses working in tertiary-level government hospitals under the Ministry of Public Health, which may limit its applicability to private facilities or lower-tier healthcare settings. Additionally, the focus on psychiatric nurses within specialized wards

further restricted generalizability to broader nursing populations, such as those working in internal medicine, surgical, or obstetric units. Regional disparities in healthcare infrastructure and administrative practices were also not accounted for in the current sample.

Future research should aim to validate and refine the T-PES-5 across a wider range of healthcare institutions, including private hospitals, secondary-level facilities, and various clinical specialties. Incorporating a geographically diverse sample would improve the generalizability of findings and allow for exploration of regional differences in nursing work environments across Thailand. Longitudinal studies are also recommended to assess the instrument's sensitivity to organizational or policy changes over time, enhancing its value as a monitoring and evaluation tool in ongoing workforce development efforts.

Conclusions

The findings from this study have indicated that the T-PES-5 is a psychometrically sound instrument that offers a concise yet comprehensive assessment of the nursing practice environment. Its alignment with the Rasch model, acceptable item fit statistics, and strong internal consistency support its use in both research and applied contexts. Notably, the instrument's precision in detecting individual differences and the absence of floor or ceiling effects suggest its practical utility for routine assessments within clinical settings. Beyond its measurement properties, the T-PES-5 holds potential as a diagnostic tool for hospital administrators and nursing leaders. Data derived from the instrument could inform targeted interventions aimed at improving workplace conditions by for instance identifying areas where nurses lack participation in decision-making or where managerial support is perceived as insufficient. By translating assessment findings into policy or practice changes, healthcare institutions can promote more supportive, equitable, and effective work environments.

Additional Information

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Ethics Approval: Permission to use the original PES-5 instrument was obtained from the author prior to the commencement of the study. Ethical approval was subsequently granted by the Institute for the Development of Human Research Protections (IHRP), Health Systems Research Institute (HSRI), Thailand (IHRP2024184 on 23 December 2024). The study was conducted in full compliance with the ethical principles outlined in the Declaration of Helsinki.

Clinical Trial Consideration: This study does not report on a clinical trial.

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Conflict of Interest: The research was carried out independently, free from any commercial or financial ties that could have resulted in conflicts of interest.

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Writing – Review & Editing: Vachira Posai

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