Practice Environment Scale-Nursing Work Index for use in primary health care: a qualitative content validity study

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Original

Estudio cualitativo de la validez de contenido de la Practice Environment Scale–Nursing Work Index para su uso en atención primaria de salud

Resumen

Objetivo: Evaluar la validez de contenido de una versión adaptada de la Practice Environment Scale–Nursing Work Index (PES-NWI) para su uso en Atención Primaria (AP).

Metodología: Se realizó un estudio cualitativo mediante entrevistas cognitivas. Ocho enfermeras de AP con perfiles diversos completaron la versión adaptada de la PES-NWI y participaron en entrevistas para explorar cómo interpretaron los ítems. El análisis se llevó a cabo utilizando el Question Appraisal System 99 (QAS-99), apoyado con notas de campo y verificación de transcripciones. Los problemas detectados se categorizaron según claridad, conocimientos requeridos, suposiciones y formato de respuesta, y sirvieron para guiar la adaptación del cuestionario.

Resultados: Veintiséis de los 34 ítems (76,5 %) fueron identificados como problemáticos por al menos una participante, con un total de 56 problemas codificados. La mayoría (87,5 %) se relacionaban con problemas de claridad, especialmente por formulaciones ambiguas o imprecisas. Todas los/las participantes consideraron los ítems relevantes y no identificaron ausencia de contenidos. Se realizaron modificaciones para mejorar la claridad y la adecuación contextual. La versión final fue aprobada por los/las participantes, el equipo investigador y la autora de la escala original.

Conclusión: La elevada proporción de ítems con problemas de claridad destaca el valor de las entrevistas cognitivas para identificar dificultades interpretativas y mejorar su redacción. Las participantes consideraron la escala adaptada relevante y exhaustiva, lo que respalda su validez de contenido y adecuación al contexto de la AP. Este estudio ofrece una metodología replicable para examinar la validez de contenido desde la perspectiva de la población destinataria.

Palabras clave

Entrevistas como Tema; Enfermería; Atención Primaria de Salud; Psicometría; Validez y Fiabilidad; Condiciones de Trabajo

Abstract

Objective: To assess the content validity of an adapted version of the Practice Environment Scale–Nursing Work Index (PES-NWI) for use in Primary Health Care (PHC).

Methodology: A qualitative study was conducted using cognitive interviews. Eight PHC nurses with diverse professional profiles completed the adapted version of the PES-NWI and participated in interviews aimed at exploring their interpretation of the items. The analysis was guided by the Question Appraisal System 99 (QAS-99), supplemented with field notes and transcript verification. Identified issues were categorised into four domains: clarity, required knowledge, assumptions, and response format. These findings informed subsequent revisions to the scale.

Results: Twenty-six of the 34 items (76.5%) were identified as problematic by at least one participant, resulting in a total of 56 coded issues. The majority (87.5%) pertained to clarity, primarily due to ambiguous or imprecise wording. All participants considered the items to be relevant and did not perceive any content omissions. Revisions were undertaken to enhance item clarity and contextual appropriateness. The final version was endorsed by the participants, the research team, and the original scale's author.

Conclusions: The high proportion of items with clarity-related issues underscores the utility of cognitive interviews in detecting interpretive difficulties and refining item wording. Participants judged the adapted scale to be relevant and comprehensive, supporting its content validity and contextual suitability for PHC settings. This study offers a replicable methodology for assessing content validity from the perspective of the target population.

Key words

Interviews as Topic; Nursing; Primary Health Care; Psychometrics; Validity and Reliability; Working Conditions

Introduction

The nursing practice environment—defined as "the organisational characteristics of a work setting that facilitate or constrain professional nursing practice"[1]—is a key factor in nurse recruitment, retention, well-being, and quality of care, impacting both patient safety and population health[2,3]. Healthy nursing work environments are linked to improve staff morale, psychological resilience, and lower burnout, supporting workforce sustainability and effective service delivery[4,5]. Conversely, poor work environments lead to attrition, absenteeism, and reduced professional satisfaction, making this a global health and policy priority[6]. Accurately assessing these environments requires valid and reliable measurement instruments tailored to diverse healthcare settings[1,7].

The Practice Environment Scale-Nursing Work Index (PES-NWI) is one of the most widely used measurement instruments to assess nursing work environments[1]. Although it has demonstrated strong measurement properties and broad international use[7,8], systematic reviews have highlighted its limited content validity due to methodological gaps[8,9]. Content validity, defined as the extent to which a measurement instrument reflects all relevant facets of the construct of interest, is the most fundamental of measurement properties[10]. It encompasses three key dimensions: relevance (to the construct and context), comprehensiveness (coverage of all key aspects), and comprehensibility (clarity and interpretation by respondents)[10,11]. Most PES-NWI validation studies have mainly focused on expert opinion and quantitative analyses[12-15], with limited attention to how nurses interpret and respond to the items. Cognitive interviewing offers a qualitative approach to address this gap by examining how respondents understand, process, and answer questionnaire items[16-18]. Despite being strongly recommended by initiatives such COnsensus-based Standards for the selection of health Measurement INstruments (COSMIN) for pretesting measurement instruments[10,11], the use of cognitive interviewing remains scarce in nursing research[18,19].This restricts the development of measurement instruments that are both methodologically robust and contextually meaningful.

Furthermore, although the PES-NWI is widely used, its original development in hospital settings [1] poses limitations when applied to Primary Health Care (PHC). PHC differs significantly from hospital settings in governance and interprofessional collaboration[20,21]. Existing PHC adaptations of the PES-NWI[22-25] often retain hospital-based constructs— such as nurse-supervisor hierarchies and physician-nurse relationships—that may be absent or less relevant in PHC, where horizontal multidisciplinary collaboration prevails. This conceptual misalignment may limit the ability of the measurement instrument to assess what truly constitutes a supportive nursing work environment in PHC.

This study addresses these two key gaps: the misalignment between existing measurement instruments and the specificities of PHC contexts, and the underutilisation of qualitative methods for examining the content validity of the measurement instruments. The aim of the study was to assess the content validity of an adapted version of the PES-NWI for use in PHC nursing in Catalonia, Spain, using cognitive interviewing. Beyond contributing to the refinement of the measurement instrument, this study provides a practical and replicable methodological approach for adapting and validating measurement instruments from the perspective of the target population.

Methods

Design

This qualitative study employed cognitive interviewing to assess the content validity of an adapted PES-NWI version for PHC nurses. It followed COSMIN guidelines for studies on measurement properties[11] and is reported following the Cognitive Interviewing Reporting Framework (CIRF)[26]. Results contributed to a subsequent measurement assessment confirming structural validity and reliability[27].

The development and translation process of the adapted PES-NWI version has been detailed elsewhere[27]. Briefly, the original English version[1] was translated into Spanish following internationally recognised guidelines[11,28,29]. A panel of nurses—including PHC care leaders, researchers, and experts in health systems—reviewed the translation for contextual suitability. Three new items were developed to capture multidisciplinary collaboration and governance features in PHC.

This study focuses specifically on the qualitative assessment of the resulting version, which comprised 34 items. Content validity was examining using cognitive interviewing based on the "question-and-answer" model. Interviews examined how PHC nurses interpreted items, instructions, and response formats; assessed item relevance and scale comprehensiveness; and identified potential clarity issues.

Study setting and recruitment

The study was conducted within the Catalan PHC system, in Catalonia—an autonomous region of Spain. This healthcare system provides publicly funded, universal health coverage through integrated networks of care. PHC in Catalonia encompasses clinical care, health promotion, preventive care and community-based interventions. Multidisciplinary PHC teams typically include administrative staff, dentists, nurses, nursing assistants, paediatricians, physicians, and social workers, among others. In recent years, additional professionals such as dietitians, psychologists, physiotherapists, and dental hygienists have been integrated to strengthen PHC services.

Participants were recruited purposively to ensure diversity in gender, age, and PHC experience. Inclusion criteria were: registered nurse status, current employment in PHC, a minimum of five years of PHC experience, and fluency in Spanish or Catalan. The five-year threshold was established to ensure that participants had sufficient exposure to the organisational dynamics, interprofessional collaboration patterns, and governance structures specific to PHC settings. This level of experience was considered necessary to support contextually grounded assessments of item relevance, comprehensibility, and comprehensiveness. Sample size was guided by COSMIN standards for qualitative content validity assessment, which recommend a minimum of seven participants for this type of study[11].

Data collection

Eight interviews were conducted between February and March 2023—seven via Microsoft Teams and one in person. Interviews lasted a median of 42 minutes (interquartile range: 37-48 minutes). Participants first completed the adapted PES-NWI unaided and were then interviewed using retrospective verbal probing. A single trained interviewer conducted all sessions.

The interviews explored understanding of items, instructions, and response formats. Probes asked participants to paraphrase, define terms, explain responses, and comment on any difficulties (see Table 1 for examples). Participants also assessed item relevance and whether any important

aspects were missing. Sociodemographic and professional background data—including gender, age, years of PHC experience, and time in current role—were collected. Field notes were taken to support identification of item-level problems. Data saturation was assessed at the item level; the criterion used was that 75% or more of the items should be identified as problematic by at least one participant.

Table 1. Description of interview questions

Comprehension questions:
- What do you think [item] means?
- What do you think [word, phrase] means in this context?
- Could you explain, in your own words, the meaning of this item? What do you think we are asking you?
Observation Questions (if applicable):
- Why didn't you answer [item]?
- Why did you change your response on [item]?
- Why did you select more than one response option on [item]?

All interviews were audio-recorded with consent and professionally transcribed. Transcripts were returned to participants for verification. Data from transcripts and field notes were organised by item and participant. After analysis, the measurement instrument was revised and re-tested with the same participants. No new issues emerged after the eighth interview or following re-testing of the revised scale, supporting the sufficiency of the sample. The final version was approved by the research team, participants, and the original PES-NWI author[1].

Data analysis

Data were analysed using the Question Appraisal System 99 (QAS-99), a structured coding framework to identify problematic item features[30]. The QAS includes appraisal categories such as clarity, assumptions, memory retrieval, bias, sensitivity, and response formatting, grounded in cognitive processing models[31].

The QAS-99 was implemented in a structured coding form to facilitate the collection and analysis of coders' observations. Two researchers independently coded all transcripts and field notes. Each item was reviewed in a stepwise manner for potential problems. The categories examined included instructions, clarity, assumptions, knowledge/memory, sensitivity/bias, and response categories. Each coding decision was binary (problem present or not), and all flagged issues were documented with justifications. Coders proposed revisions where necessary. Discrepancies were resolved through discussion or, if needed, adjudication by a third coder.

While the QAS-99 primarily focuses on issues of clarity and cognitive processing, the analysis also incorporated qualitative feedback related to item relevance and comprehensiveness, allowing the research team to identify potential gaps and unnecessary items, and to ensure conceptual alignment with the realities of PHC nursing.

Ethical considerations

The study received approval from the Ethics Committee of the *Fundació Institut Universitari per a la recerca a l'Atenció Primària de Salut Jordi Gol i Gurina* (IDIAPJGol) (code 22/210-P). Permission to use the original PES-NWI was granted by her author[1]. Written informed consent was obtained from all participants after they received detailed information about the aims of the study, procedures, data protection measures, and their rights. Confidentiality was ensured by assigning study codes and storing identifying information separately from research materials.

Rigour and reflexivity

Rigour was ensured through adherence to COSMIN and CIRF standards, systematic coding by two independent researchers, and data triangulation using transcripts and field notes. Participant transcript reviews further enhanced trustworthiness.

Reflexivity was addressed through awareness to the researchers' professional backgrounds as PHC nurses and qualitative researchers. Team discussions and reflective practices were used to identify and mitigate potential biases during analysis and interpretation.

Results

A total of 11 nurses were contacted, of whom eight agreed to participate. The main characteristics of these participants are presented in Table 2. Seventy-five per cent identified as women (n=6) and 25 per cent as men (n=2). The median number of years of experience in PHC was 17.5 years, ranging from six to 37 years.

Out of the 34 items included in the adapted version of the PES-NWI, 26 (76.5%) were identified as problematic by at least one participant. The number of problematic items identified per participant ranged from two to 15 (see Table 2). No meaningful pattern was observed between participant characteristics and the number of issues identified.

Across the 26 problematic items, a total of 51 issues were identified, resulting in 56 problem codes based on the QAS-99 framework. The discrepancy between the number of issues (51) and the total number of codes (56) was due to the presence of multiple problems within individual items. Of the 56 codes, 49 were related to clarity—including 44 cases of vague wording issues and five lexical issues—while seven were categorised as knowledge-related problems. All issues could be coded using the QAS-99 categories, and no additional cognitive issues were identified beyond those defined by the framework.

All participants considered the items in the measurement instrument to be rel-

Table 2. Description of the eight informant nurses and preliminary revised primary health care version of the PES-NWI problems encountered in cognitive interviews

ID	Gender	Age group	Years of experience in primary health care	Years in current role	Number of problematic items identified	Number of problem codes identified
1	Woman	35-44	18	10	4	5
2	Man	55-64	37	6	15	18
3	Woman	45-54	17	2	3	3
4	Woman	55-64	31	23	3	3
5	Woman	45-64	15	<1	5	5
6	Woman	35-44	20	18	10	11
7	Man	25-34	10	<1	2	2
8	Woman	25-34	6	4	9	9
Total					51	56

evant to PHC nursing practice. Moreover, no participant identified missing content, suggesting that the measurement instrument was perceived as comprehensive in covering the key domains of the PHC nursing work environment.

Table 3 provides an overview of the seven most problematic items from the pretested version of PES-NWI. For each, the table presents the original wording, the type and frequency of cognitive problems identified, illustrative quotations from the interviews, a description of the issue(s), and the final revised wording.

Discussion

this study used cognitive interviewing to assess the content validity of an adapted version of the PES-NWI for PHC nurses. The high proportion of items identified as problematic—primarily due to issues of clarity and, to a lesser extent, knowledge—demonstrates the value of this method for uncovering interpretive challenges. Despite these issues, all participants affirmed the relevance of items, and none identified missing content, indicating strong comprehensiveness.

Although qualitative methods for evaluating content validity—particularly cognitive interviewing—are increasingly recommended[10,18], they remain underused in nursing research[19]. The study findings underscore the added value of cognitive interviewing in revealing how intended users engage with measurement instrument content. As content validity directly influences other measurement properties—such as internal consistency and structural validity—this qualitative phase is crucial[10].

Notably, the findings also highlight the importance of contextual alignment. Constructs based on hospital settings, if unadapted, can hinder interpretability and response accuracy in PHC contexts. Addressing these mismatches enhances both metric robustness and practical utility. Beyond improving the PES-NWI for use in PHC, this study offers a replicable methodological approach. The combined use of cognitive interviewing and the QAS-99 appraisal system enabled systematic identification and classification of item-level issues[18,30-32]. This structured process facilitated evidence-based revisions and exemplifies best practices in content validation.

PHC nurses play an essential role in promoting equitable access to care, particularly for underserved and vulnerable populations[33,34]. Accurately assessing their work environments is, therefore, crucial for supporting effective workforce planning, service delivery improvement, and health policy development. Strengthening content validity in measurement instruments like the PES-NWI can generate more valid and meaningful data, ultimately contributing to evidence-based strategies that address professional wellbeing, service quality, and population health equity.

Strengths and limitations of the work

This study has several strengths. First, it is, to our knowledge, the first to apply cognitive interviewing to assess the content validity of any PES-NWI version. This represents a methodological advance given the widespread use of the measurement instrument and the limited evidence regarding its content validity[8,9]. Second, the study followed internationally recognised standards for content validity assessment[11], enhancing methodological rigour and reproducibility. Third, it was reported in accordance with the CIRF[26], supporting transparency. Finally, combining cognitive interviewing with the QAS-99 allowed detailed, systematic item analysis, offering a model applicable in other settings.

Nevertheless, certain limitations should be considered. The sample size,

Table 3. Most problematic items identified and their codes according to Question Appraisal System (QAS)

Item number	Original item	Pretested item	QAS Problem codes (num. of informant nurses who experienced problems)	Interview Quotations	Problem description	Final wording of item (fundamental changes are in bold and underlined)
1	Adequate support services allow me to spend time with my patients.	There are adequate support services and professionals* that allow me to spend time with the people I care for. *(*"support services and professionals": nursing assistants, administrative staff, cleaning staff...)*	Clarity 3c. Vague (4)	"[…] says time, the time we already have, or is it more time?" "I think of the physicians, I think of the social worker, I think of figures that have been incorporated recently, such as the emotional wellbeing professionals."	The need arises to add an adjective to the term time; it is not just a question of spending time but of the necessary time. It is better to specify that it supports nursing practice; otherwise, it can be understood as support for interdisciplinary care.	There are adequate support services and professionals* for nursing care that allow me to dedicate the necessary time to the people I care for *(*nursing assistants, administrative staff, cleaning staff...).*
4	Active staff development or continuing education programs for nurses.	There are active professional development or continuous training programmes for nurses.	Clarity 3c. Vague (3)	"I think it may sow the seeds of doubt regarding whether it is active at the company level or outside the company."	It is better to specify that these two circumstances must occur in the health centre.	In the centre, there are active professional development or continuous training programmes for nurses.
14	High standards of nursing care are expected by the administration.	The centre's management team expects high-quality nursing care.	Clarity 3a. Wording (2) 3c. Vague (1)	"I understand the word "expectation" not only as something that needs to be done, but as something I would fight for, not the management team, right?" "[…] it promotes or favours high-quality nursing care because it is also part of the management team's responsibility that we become better."	The use of the verb "expect" is ambiguous and not suitable. It is better understood that the management team acquires this commitment.	The centre's management team **is** committed to provide high-quality nursing care
18	A clear philosophy of nursing that pervades the patient care environment.	There is a clear nursing philosophy that pervades the patient care environment.	Clarity 3a. Wording (1) 3c. Vague (3)	"[…] pervades, it is not to pervade, it is to cover or to veil, but not to pervade, […]." "I had doubts because I did not understand what philosophy meant."	The verb used seems inappropriate. Philosophy is an ambiguous term	There is a clear nursing philosophy* that is transmitted to the patient care environment. ***(*way of thinking or seeing things).***
20	A nurse manager who backs up the nursing staff in decision making, even if the conflict is with a physician.	The centre's management team back up the nurses' decisions, even if the conflict is with a physician.	Clarity 3c. Vague (3)	"The problem for me is the verb 'back up', in the sense that it is not the same as supporting". "I understand that the management team offers support or accompanies you in the event of a conflict".	Backing up is understood as supporting you even if you are not right; it has a negative connotation.	The centre's management team provides support to nurses in their decisions, even if they conflict with a physician.
23	Staff nurses are involved in the internal governance of the hospital (e.g., practice and policy committees).	The team nurses are involved in the internal organisation of the centre (e.g., in committees and working groups).	Clarity 3a. Wording (3) 3c. Vague (4)	"Involvement is associated with something that the nurse wants herself". "It seems to refer to the initiative of the nurses themselves".	Involvement is interpreted as an initiative of nurses, not of the environment towards nurses.	The team nurses are considered in the internal organisation of the centre (e.g., in committees and working groups).
31	Use of nursing diagnoses.	Use of nursing diagnoses.	Clarity 3c. Vague (3)	"Here in nursing diagnoses, there could be confusion in the sense that other nursing diagnoses are used in our system and not only NANDA diagnoses."	Possibility to add examples to the question to make the concept more straightforward.	Use of nursing diagnoses *(e.g., NANDA or other nursing terminology)*

NANDA, North American Nursing Diagnosis Association

although consistent with COSMIN guidance for qualitative evaluations of content validity, was relatively small and may not have captured all possible issues. However, participant diversity and data saturation strengthen confidence in the findings. Another potential limitation is that the study was conducted in a single geographical and health system context (Catalonia, Spain), which may limit transferability of the specific item revisions to other PHC settings. While the methodology is replicable, further studies in different settings are needed to confirm cross-contextual applicability.

Recommendations for further research

Future studies should further explore qualitative methods in measurement instrument validation, particularly in under-represented settings like PHC, where context specificity is essential. Broader use of cognitive interviewing and respondent-centred techniques could improve the relevance and utility of measurement instruments across healthcare contexts. Comparative studies on pretesting strategies across cultures and healthcare systems would also inform best practices in measurement instrument adaptation.

In addition, future research should examine the applicability and content validity of the adapted PES-NWI in PHC systems beyond Catalonia. Investigating whether contextual features—such as governance structures, interprofessional collaboration, or nursing roles—affect item interpretation will be essential to ensure validity across settings. To support such efforts, established frameworks for cross-cultural validity and contextual equivalence, such as those proposed by COSMIN, should be applied systematically. This would help ensure that future adaptations of the PES-NWI remain both psychometrically robust and contextually meaningful.

Implications for policy and practice

This study reinforces the importance of rigorous, user-centred validation approaches in developing nursing and healthcare services measurement instruments. Cognitive interviewing, applied per international guidance, reveals item-level issues that might otherwise remain hidden. This enhances both the interpretability of items and the overall utility of the measurement instrument.

Valid measurement instruments are vital for capturing the organisational factors that shape nurses' capacity to provide safe, equitable, and effective care. The adapted PES-NWI, refined through this study, offers a context-appropriate measurement instrument for PHC. Data from its application may inform policies and interventions to strengthen PHC nursing workforce conditions and service delivery.

Moreover, this study provides a transferable methodological model for validation that can guide future adaptation efforts in diverse healthcare settings. It responds to calls for research supporting healthy work environments through evidence-based measurement instruments and practices. Pretesting with cognitive interviewing methods ensures that measurement instruments reflect the experience of frontline professionals, enhancing their practical and policy relevance.

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