Psychometric Properties of The Thai Version of the Nurses' Intention to Participate in Advance Care Planning Instrument

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Abstract: Advance care planning is an essential process in healthcare that necessitates active participation from all involved professionals, particularly nurses. However, in Thailand, nurse involvement in ACP is limited. Assessment of nurses' intention to participate in advance care planning is necessary to organize training courses to improve their participation in this critical event. However, there is no tool to evaluate Thai nurses' intention to participate in Advance care planning. Thus, we selected the Health Professionals' Experience and Attitudes Questionnaire on Advance Care Planning to culturally adapt and validate it in the Thai context. We achieved this through a five-step process: (1) standard translation procedures, including forward translation, reconciliation, and back-translation; (2) item refinement through an expert panel; (3) conducting content validity and cognitive interviews; and (4) confirmation of the first culturally adapted tool by the expert panel on the factors. The panel of experts suggested adding the knowledge dimension and changing the name to the Nurses' Intention to Participate in Advance Care Planning and (5) The Thai version was tested for validity and reliability using confirmatory factor analysis, average variance extracted, and the Fornell–Larcker criteria matrix, Cronbach's α, and composite reliability.

The final version achieved from testing with 260 registered nurses from a teaching hospital in Bangkok is comprised of 20 items distributed across five key dimensions, namely 'intention,' 'attitude,' 'subjective norm,' 'perceived behavioral control,' and 'knowledge,' demonstrating an excellent model fit, strong composite reliability, and robust internal consistency. This newly adapted tool is a resource for policymakers and nurse educators designing targeted training courses to enhance nurses' competency in advance care planning. However, before this tool is widely implemented, it would be beneficial to test it further across diverse groups of nursing professionals.

Keywords: Advance care planning, Attitude, Intention, Knowledge, Nursing, Psychometric testing, Reliability, Theory of Planned Behavior, Validity

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Introduction

Advance care planning (ACP) is preparing for medical and nonmedical preferences or future care. It involves discussing one's preferences with

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healthcare providers, family members, and loved ones, and these preferences are documented to ensure that they are respected if the person can no longer make decisions or communicate their preferences.[1] ACP is an important aspect of healthcare because it ensures that a person's preferences are heeded and helps reduce suffering for patients and their families. Nurses often have many opportunities for constant communication with patients and their families; thus, they play a key role in facilitating ACP.[2] They are in an excellent position to initiate, facilitate, and advocate for ACP-related communication with patients and other members of an interprofessional team.[3] Nurses' intention to participate in ACP is positively correlated with the likelihood of engagement in ACP.[4] It is critical to recognize the importance of nurses' attitudes and intentions toward ACP, as this will help develop strategies to improve nurses' engagement. Lack of nurses' involvement in ACP can have devastating consequences for patients and their families, such as prolonged suffering, emotional distress, and unnecessary healthcare costs. Therefore, improving nurses' participation in ACP is crucial to ensure that patients receive the care and support they need and want during their end-of-life stage.

However, nurses' ACP participation remains low. Studies have shown that only 10%-40.5% of nurses have experience in ACP.[5,6] This trend may be due to the lack of explicit guidelines for nurses' roles in ACP,[7] lack of clarity regarding their responsibilities in ACP,[7-9] and inadequate knowledge, time, experience, and training related to ACP.[8-11] Without sufficient support, nurses may hesitate to initiate ACP discussions or lack the knowledge and skills to do so effectively. As a result, patients and families may miss out on making informed decisions about end-of-life care, leading to negative outcomes such as prolonged suffering, emotional distress, and unnecessary healthcare costs. Nurses' participation in ACP can significantly improve patient care and quality of life. Detering et al.[12] found that patients who engaged in ACP discussions with nurses had a better quality of life, experienced less anxiety, and less depression than those who did not. Similarly, Pimsen et al.[13] demonstrated that ACP discussions with nurses could reduce unnecessary hospitalization. Overall, nurses' participation in ACP can significantly improve patient care and quality of life by promoting ACP discussions, providing guidance and support to patients and families, initiating conversations about patients' goals, values, and preferences, informing them about treatment options, advocating for patients, and providing emotional support.

In Thailand, although the 2007 National Health Act endorsed improved end-of-life care policies and services, including the right to refuse treatment,[14] the Thai Ministry of Public Health developed national guidelines for palliative care and a training program for healthcare professionals in 2014. Moreover, expert nurses appointed by the Thai Nursing Council in 2015 developed competencies and training courses for palliative care.[15] Despite these efforts, Thai nurses' involvement in ACP remains limited not only because of insufficient training and experience but also because of their beliefs, especially in filial piety, which is upheld in Thai culture and influences end-of-life care decisions. Additionally, discussions about death and dying are taboo, making it difficult for nurses to initiate conversations about ACP.[16]

These cultural factors contributed to the low participation of Thai nurses in ACP. Similar challenges are present in other countries, although the specific cultural and systemic issues may differ. For instance, in Western countries, nurses often face barriers, such as time constraints, lack of experience, and communication difficulties.[8,9]

This scenario underscores the need for instruments to gauge Thai nurses' intention to participate in ACP. One such instrument, the Health Professionals' Experience and Attitudes Questionnaire on ACP (HEAQ-ACP), developed initially in Hong Kong, is a viable option. Grounded in the Theory of Planned Behavior (TPB), this tool was designed to study healthcare professionals' ACP engagement intention, with a content validity index

of 1.0 and no other advanced psychometric properties.[18] The HEAQ-ACP emphasizes the role of ACP training and experience in fostering healthcare professionals' ACP participation intention.[18]

Recognizing this gap and the cultural congruities between Hong Kong and Thailand, including a shared belief in filial piety, coupled with the national efforts to elevate end-of-life care and ACP programs, we selected the HEAQ-ACP. This TPB-based tool examines nurses' intention towards ACP for cultural adaptation to the Thai context.[17,18]

Therefore, our primary goal in selecting this questionnaire was to gain an in-depth understanding of Thai nurses' intentions, rooted in our efforts to adapt and validate existing instruments to measure Thai nurses' ACP participation intentions precisely. To achieve this, we extended the original scale's purview by culturally adapting it to Thai nurses and conducting an in-depth psychometric evaluation.

Review of Literature

Human behaviors, including engagement in ACP, are widely recognized to be influenced by factors such as attitude, perceived behavioral control, intention, and knowledge.[19] Existing research illustrates that these elements, particularly attitude and perceived behavioral control, can promote active participation in ACP among nurses.[20,21] In this scenario, the TPB is an instrumental model that sheds light on health-related decision-making processes.

Extensive studies have applied the fundamental components of TPB (attitude, subjective norm, perceived behavioral control, and intention) to determine ACP involvement.[17,21,22] These concepts significantly influence an individual's decision to engage in ACP, making TPB a suitable theoretical framework for analyzing nurses' involvement in ACP.

The TPB postulates that intention primarily determines behavior, which is influenced by attitude towards the behavior, subjective norm, and perceived behavioral control.[23] In terms of ACP, this can be interpreted as follows: nurses' attitude towards ACP (whether they view it positively or negatively), their perception of societal expectations (the subjective norm), and their belief in their ability to successfully perform the task (perceived behavioral control) will collectively influence their intention to engage in ACP. This intention directly impacts their actual engagement in ACP.[24] ACP is considered a health behavior because it involves individuals actively engaging in actions that affect individual health outcomes. The TPB is a beneficial model as it helps predict and explain nurses' participation in ACP based on their attitudes, perceived behavioral control, and subjective norms.[23,24]

Interestingly, the HEAQ-ACP is the sole instrument grounded in the TPB, which explores nurses' ACP intention. This tool, developed by researchers in Hong Kong, integrates dimensions that reflect TPB concepts. It highlights the importance of a healthcare provider's intention to participate in ACP and has been successfully employed in empirical studies.[18]

Given the cultural similarities between Hong Kong and Thailand, especially the shared belief in filial piety, the HEAQ-ACP is an excellent tool for cultural adaptation within the Thai nursing community. Filial piety significantly influenced attitudes towards end-of-life care, further reinforcing the tool's relevance. As both Hong Kong and Thailand strive to enhance end-of-life care and ACP programs, applying the HEAQ-ACP in Thailand appears promising.

Study Aim

This study aimed to culturally adapt and examine the psychometric properties of the HEAQ-ACP among Thai nurses.

Methods

Design: This study used a tool development method and a cross-sectional study. This report followed

the STROBE (Strengthening the Reporting of Observational Studies in Epidemiology) statement. There were two phases: Phase 1 focused on the cultural adaptation of the scale, and Phase 2 focused on psychometric properties testing.

Phase 1: Cultural Adaptation

The HEAQ-ACP was adapted to the Thai context after obtaining approval from its original author. Rooted in the TPB, the HEAQ-ACP originated from a validated 2022 study in Hong Kong and encompassed a variety of healthcare professionals with a content validity index of 1.0.[18]

This scale comprises 28 items across four critical facets of ACP: intention, attitude, subjective norm, and perceived behavioral control. The 'attitude' dimension is the most expansive, with 19 varied items consisting of four positive, one negative, and 14 neutral statements. In contrast, 'intention' with one item, 'subjective norm' with two items, and 'perceived behavioral control' with six items are exclusively neutral, focusing on unbiased responses towards ACP from the participants.

Each item is scored on a 5-point Likert scale, with "strongly disagree" (1) to "strongly agree" (5). The combined score provides a comprehensive view of the respondents' intentions regarding ACP. All items are neutral to encourage unbiased responses, except for one negatively framed 'attitude' item, which is reverse-scored.

The cultural adaptation process comprises the following stages:

(i) Independent translation: The original instrument was translated from English to Thai following a structured translation procedure (forward translation, reconciliation, and back translation). For each stage, two bilingual translators were assigned to ensure independent and objective translation of the instrument. These translators were fluent in both languages and contributed their unique skills to the forward or back translation steps.

(ii) Expert review: Four experts reviewed all translated items. This panel consisted of a professor specializing in decision-making in palliative care, another professor with in-depth knowledge of TPB, a nurse experienced in end-of-life care, and a professional translator devoid of medical background. Two experts participated in the back-translation step.

(iii) Content validity and cognitive interviews: Before conducting cognitive interviews, we undertook a content validity test using a panel of six experts to assess the cultural relevance and clarity of the instrument. They evaluated each item on a 1-4 scale, where 1 implied 'not relevant, not simple, not clear' and 4 signified 'very relevant, very simple, very clear.' These ratings facilitated the calculation of the content validity index (CVI) for each item. Following Polit and Beck's guidelines,[26] we established an acceptable CVI threshold for item inclusion of 0.79. This process led to minor adjustments of the items based on expert feedback. After establishing content validity, cognitive interviews were conducted with 20 nurses to provide critical insights into the instrument's cultural appropriateness and applicability.

(iv) Confirmation: Following these steps, the culturally adapted scale was acknowledged as Thailand's first version of the HEAQ-ACP. This version incorporates the cultural and contextual nuances of the Thai nursing profession, ensuring its validity and effectiveness for subsequent applications. The expert panel identified four main dimensions of the study scale based on previous studies that utilized the study instrument and TPB. These dimensions included nurses' intention to participate in ACP, their attitudes toward ACP participation, subjective norms toward ACP participation, and perceived behavioral control toward ACP participation.

During the review process, the phrase 'performing ACP' was changed to 'participating in ACP.' One item related to ACP policy and guidelines was removed because of the lack of such guidelines in Thailand.

To ensure measurement invariance, the expert panel suggested encompassing dimension and meaning equivalence through theoretical justification and expert judgments.[23-25] Moreover, nurses' perceived knowledge is deemed essential for capturing Thai nurses' intentions,

as it plays a vital role in understanding and predicting behavior and is particularly relevant in end-of-life care and ACP involvement.[17] Thus, the expert panel recommended the removal of one irrelevant item and the addition of nine items to the scale and changed the title of the HEAQ-ACP to Nurses' Intention to Participate in Advance Care Planning (NIPACP).

With the integration of the knowledge dimension into the TPB framework, a more comprehensive understanding of Thai nurses' intentions was achieved, emphasizing the importance of considering cultural and contextual factors when adapting the TPB to different contexts. Consideration of various cultural and contextual factors resulted in a culturally adapted scale that incorporated the concept of knowledge and allowed for further cultural adaptation.

The First Version of Nurses' Intention to Participate in Advance Care Planning (NIPACP)

The first version of the NIPACP comprised five dimensions with 36 items; intention (4 items), attitudes (19 items), subjective norm (4 items), perceived behavioral control (5 items), and knowledge (4 items). All items are scored on a 5-point Likert scale ranging from "strongly disagree (1)" to "strongly agree (5)." It is important to clarify that each dimension score reflects the level of its corresponding concept - intention, attitude, subjective norm, perceived behavioral control, and perceived knowledge about ACP participation - rather than the whole NIPACP. Therefore, a higher score on each dimension suggests a higher level of a particular concept. Notably, each subscale's score interpretation was based on the developer's investigation of the relationship between each dimension and ACP experience, focusing on individual dimensions rather than the entire scale.

Content validity testing resulted in a mean CVI score of 1.00, indicating high content validity. Subsequent cognitive interviews involving 20 nurses indicated that the questionnaire was easy to understand; thus, no further changes were made. The expert panel approved the culturally adapted HEAQ-ACP as the first version of the NIPACP, which serves as a culturally appropriate tool for understanding Thai nurses' intention to participate in ACP.

Phase 2: Psychometric Properties Testing

This phase focused on validating a culturally adapted scale (the first version of the NIPACP). It incorporates validity and reliability tests with the data statistically evaluated to determine the scale's psychometric properties.

Sample and Setting: The study was conducted in a major teaching hospital in Bangkok with 2,901 registered nurses (RNs) on staff. Professor Soper's Structural Equation Model 4.0[27] was used to calculate the sample size. This model considered an effect size of 0.3, power of 0.8, and significance level of 0.05, resulting in a targeted sample size of 200 RNs. This figure is within the recommended range (150-200) for unbiased confirmatory factor analysis (CFA) estimation.[28-30]

Survey invitations were sent to 500 RNs, anticipating a 40% response rate as in previous online nursing surveys.[31] This strategy aimed to secure an adequate sample size and compensate for potential non-responses or outliers.

The inclusion criteria stipulated that participants must (i) be employed in inpatient units, intensive care units, emergency departments, or outpatient units and (ii) have completed a 6-month training program for new nurses. RNs working in pediatric units were excluded because the study focused on decision-making for capable individuals unrelated to pediatric ACP.

Participants were selected using a two-step sampling approach. First, stratified random sampling was employed, followed by simple random sampling from a hospital nurse directory. The final list of the selected RNs was sent to the research division of the nursing department. This division was tasked with sending a digital survey invitation, complete with a QR code linked to the online platform SurveyMonkey, directly to the personal inboxes of RNs via the hospital's internal communication system.

Of the 260 surveys returned, 37 were discarded due to incomplete data, yielding 223 responses for

data analysis. Despite the 52% (260 of 500) response rate not being exceptionally high, it was deemed acceptable as it exceeded the minimum 30% usually considered sufficient for online surveys. Moreover, 50% is considered acceptable.[31-33] Furthermore, a sample size exceeding 200 satisfied the requirements for unbiased estimation in the CFA.[28-30]

Demographic Questionnaire: This study's personalized information questionnaire collected crucial demographic and professional information from participants. It asked for sex, age, marital status, number of children, and religious affiliation. Moreover, it included professional data, including academic qualifications, primary work domain within the hospital, weekly working hours, and years of clinical experience.

The questionnaire investigated the participants' past experiences with ACP, incorporating their participation, formal training, and personal interactions with ACP. This approach assessed familiarity and engagement with ACP in both the professional and personal spheres.

Ethical Considerations: Ethical approval was obtained from the Human Research Protection Unit of the Faculty of Medicine Siriraj Hospital and the Institutional Review Board of the Faculty of Nursing at Mahidol University (MU-MOU-IRB-NS 2022/26.2607).

Informed consent was assured through an online survey with comprehensive study information and an electronic consent form. The participants were explicitly informed of the study's purpose, the processes involved, and the voluntary nature of their participation. The anonymity and confidentiality of all participants were strictly maintained. No personal identification data, including IP addresses, were collected.

Data Collection: The 36-item NIPACP was administered using SurveyMonkey. Recruitment was performed through the hospital's internal communication system, wherein prospective participants were sent an invitation letter bearing the QR code that provided access to the survey questionnaire. The first page of the online survey provides the study information and bears a consent form. Only when participants provided e-consent would they be given access to the questionnaire. The survey took approximately 15-20 minutes, and the participants were rewarded with 1 USD (30 baht) for participation. The collected data were downloaded from the online platform and then exported to the JASP (Jeffreys's Amazing Statistics Program) statistical software version 0.17.1.0 for Windows and to the lavaan (latent variable analysis) package for R for statistical analysis.[34]

Data Analysis: The data analysis began with a descriptive analysis. This method allowed us to efficiently summarize and understand the demographic characteristics of our sample using simple statistical measures.[28]

Next, construct validity was used to determine the efficacy of the NIPACP, rooted in the solid theoretical TPB framework, and mirrored the well-established HEAQ-ACP scale. CFA was employed to fit the 36-item NIPACP into the five-factor model. Several indices, including the χ^2 statistic, Tucker-Lewis index (TLI), incremental fit index (IFI), comparative fit index (CFI), root mean square error of approximation (RMSEA), and standardized root mean square residual (SRMR), were used to evaluate the model fit. The model was considered fit if TLI, IFI, and CFI values exceeded 0.9, and RMSEA and SRMR were below 0.08.[28,35] When the initial model showed poor fit, items with factor loading below 0.6 were removed. As informed by several empirical studies, our choice of a 0.6 factor loading cutoff achieves an optimal balance between statistical precision and construct relevance. This ensures that only items with substantial contributions to their respective factors are retained, mitigating misinterpretation risks.[36-38] This strategy enhances the study's validity and meaningful representation of key concepts. Subsequently, CFA was re-performed using the revised scale.[28]

For construct validity, we investigated convergent and discriminant validity. The construct validity of the NIPACP was established using convergent and discriminant validity checks. Convergent validity, which affirms that

theoretically similar items are related, was demonstrated with an average variance extracted (AVE) value of 0.50 or higher for each dimension.[36] Discriminant validity, a measure to ensure the distinctness of different theoretical concepts, was deemed satisfactory when the squared AVE value for a dimension surpassed its correlations with other dimensions.[36]

In the final stage, reliability testing was conducted to ensure the consistency of the NIPACP over time. This involved checking internal consistency with Cronbach's α and evaluating composite reliability using a factor-based test with acceptable scores ≥ 0.70 or above.[36] These steps verified the tool's consistent results and research credibility.

Results

Participants

The majority (92.4%) of 233 respondents were female, with a mean age of 33.9 years (range 22-60 years; SD = 10.83). Almost all participants (96.9%) identified themselves as Buddhists. Their average work experience as a nurse was 11.68 years (range 1-41 years; SD = 10.52). Most respondents did not have formal ACP training nor participated in ACP (70% and 64.6%, respectively).

Step 1: Test the Existing Model

CFA was used to evaluate the fit of both the original 28-item scale and the culturally adapted 36-item version, as a panel of experts suggested. The adapted version included a knowledge dimension important for capturing Thai nurses' intention to participate in ACP. The results revealed that neither the original nor the culturally adapted 36-item version demonstrated an optimal fit with the data.

However, between the original and culturally adapted 36-item versions, the latter demonstrated a notably better fit with data. This finding strongly supports cultural adaptation and underscores the importance of incorporating expert input into developing culturally adapted scales. These results suggest that the items in the culturally adapted 36-item version, including the added knowledge dimension, are more likely to provide a valid, reliable, and meaningful representation of the concepts used in this study, considering the unique cultural context of Thai nurses. The present findings, obtained using the culturally adapted 36-item version, better positions Thai nurses' intentions regarding ACP participation and the role of knowledge in their decision-making processes (**Table 1**).

Step 2: Scale Revision

After determining the comparative fit, items with factor loadings of < 0.60 were removed from the scale. Sixteen items were deleted. Specifically, 14 items were removed from attitude, and two were removed from perceived behavioral control. The intention, subjective norm, and knowledge were retained in all original items (**Table 1**). These findings suggest that the NIPACP is a potential measurement tool for ACP research, although further revisions are required to improve its validity and reliability.

Table 1. Comparison of fit indices for the three alternative models

Model	No. of Factors	No. of Items	χ^2	df	p	CFI	TLI	IFI	RMSEA	SRMR
Original	4	28	7,905.003	594	< .001	0.871	0.864	0.862	0.235	0.169
First expert-suggested	5	36	4,590.361	584	< .001	0.930	0.930	0.920	0.176	0.142
Final	5	20	361.744	160	< .001	0.996	0.995	0.993	0.075	0.063

Note: df = degrees of freedom; CFI = comparative fit index; TLI = Tucker-Lewis index; IFI = Incremental Fit Index; RMSEA = Root Mean Square Error of Approximation; SRMR = Standardized Root Mean Square Residual; Reference values are shown where lower values are better, and sensitivity to the sample size is important. Values > 0.90 for CFI, TLI, and IFI, and RMSEA and SRMR values < 0.08 were generally considered a good fit.

Step 3: CFA with Revised Model

CFA was re-run using the revised 20-item model. The revised model results showed a good fit with the absolute goodness-of-fit indices (**Table 1**). The factor loadings for each item were all > 0.60 (**Table 2**), indicating an excellent model fit. Although the chi-square test result was significant with a p-value of 0.001, note that the chi-square test is sensitive to sample size. Even small deviations from a perfect fit significantly affect the chi-square test results when the sample sizes are large. Therefore, it is appropriate to rely on other fit indices that are less affected by sample size (i.e., TLI, IFI, CFI, RMSEA, and SRMR).[35]

Table 2. Factor loadings of the final 20-item NIPACP scale

Factor	Item	Thai translations	Factor loading	p-value	95% Confidence Interval	
					Lower	Upper
Intention	1. I intend to participate in advance care planning with patients and their families.	1. ฉันตั้งใจที่จะร่วมวางแผนการดูแลล่วงหน้ากับผู้ป่วยและครอบครัว	0.859	< .001	0.82	0.899
	2. It is my plan to carefully mind the participate in ACP.	2. ฉันมีแผนการชัดเจนเกี่ยวกับการร่วมการดูแลล่วงหน้า	0.868	< .001	0.833	0.903
	3. I plan to participate in ACP in the next decision.	3. ฉันวางแผนเข้าร่วมการวางแผนการดูแลล่วงหน้าในครั้งต่อไป	0.904	< .001	0.87	0.938
	4. I plan to participate in ACP whenever I can.	4. ฉันวางแผนที่จะเข้าร่วมการวางแผนการดูแลล่วงหน้าเมื่อมีโอกาส	0.766	< .001	0.73	0.803
Attitude	1. ACP related to my current clinical duties.	1. การวางแผนการดูแลล่วงหน้ามีความเกี่ยวข้องกับบทบาทหน้าที่ของคุณ	0.841	< .001	0.795	0.887
	2. ACP can help to prevent disputes between health care team and family members on medical decisions.	2. การวางแผนการดูแลล่วงหน้าช่วยลดความขัดแย้งในการตัดสินใจเกี่ยวกับการรักษาระหว่างทีมบุคลากรสุขภาพและญาติ	0.766	< .001	0.719	0.812
	3. ACP should be integrated into routine care services for patients with chronic illnesses.	3. การวางแผนการดูแลล่วงหน้าควรถูกกำหนดไว้ในการดูแลพื้นฐานที่ผู้ป่วยโรคเรื้อรังทุกคนควรได้รับ	0.797	< .001	0.754	0.841
	4. ACP is helpful to clarify patients' goals and preferences for end-of-life care.	4. การวางแผนการดูแลล่วงหน้าช่วยให้เกิดความชัดเจนเกี่ยวกับความต้องการ และเป้าหมายการดูแลในระยะสุดท้ายของผู้ป่วย	0.773	< .001	0.731	0.816
	5. ACP should be started early to allow time for contemplation.	5. การวางแผนดูแลล่วงหน้าควรเริ่มให้เร็วที่สุด เพื่อให้ผู้ป่วยมีเวลาไตร่ตรองเกี่ยวกับความต้องการในการดูแลในระยะท้าย	0.722	< .001	0.677	0.768

Table 2. Factor loadings of the final 20-item NIPACP scale (Cont.)

Factor	Item	Thai translations	Factor loading	p-value	95% Confidence Interval	
					Lower	Upper
Subjective norm	1. My seniors/supervisors support me to participate in ACP.	1. หัวหน้าสนับสนุนคุณให้มีส่วนร่วมในการวางแผนการดูแลล่วงหน้า	0.974	< .001	0.953	0.995
	2. My co-workers support me to participate in ACP.	2. เพื่อนร่วมงานสนับสนุนคุณให้มีส่วนร่วมในการวางแผนการดูแลล่วงหน้า	0.981	< .001	0.959	1.003
	3. The hospital policy supports me to participate in ACP.	3. หน่วยงานสนับสนุนคุณให้มีส่วนร่วมในการวางแผนการดูแลล่วงหน้า	0.916	< .001	0.894	0.938
	4. I am expected to participate in ACP seriously.	4. ฉันถูกคาดหวังให้มีส่วนร่วมในการวางแผนการดูแลล่วงหน้า	0.861	< .001	0.832	0.89
PCB	1. I am confident in participating in ACP.	1. ฉันมั่นใจในการมีส่วนร่วมวางแผนการดูแลล่วงหน้ากับผู้ป่วยและครอบครัว	0.839	< .001	0.798	0.88
	2. I am familiar with the hospital' policy regarding ACP.	2. ฉันคุ้นเคยกับนโยบายการวางแผนการดูแลล่วงหน้าของโรงพยาบาล	0.884	< .001	0.845	0.924
	3. I am comfortable with discussing end-of-life care issues with patients.	3. ฉันสามารถสนทนาประเด็นต่าง ๆ ในระยะท้ายของชีวิต กับผู้ป่วยได้อย่างสะดวกใจ	0.75	< .001	0.711	0.789
Knowledge	1. I have sufficient knowledge to participate in ACP.	1. ฉันมีความรู้เพียงพอที่จะร่วมวางแผนการดูแลล่วงหน้า	0.975	< .001	0.952	0.998
	2. I feel knowledgeable about ACP.	2. ฉันมีความรู้ความเข้าใจเกี่ยวกับการวางแผนการดูแลล่วงหน้า	0.970	< .001	0.947	0.992
	3. I understand the purpose of ACP.	3. ฉันเข้าใจเกี่ยวกับวัตถุประสงค์ของการวางแผนการดูแลล่วงหน้า	0.852	< .001	0.819	0.881
	4. I understand the process of ACP.	4. ฉันเข้าใจกระบวนการการวางแผนการดูแลล่วงหน้า	0.922	< .001	0.899	0.945

Note: SD = Standard deviation, SN = Subjective norm, PCB = Perceived behavioral control

Step 4: Validity and Reliability

The validity and reliability of the 20-item scale were also evaluated (**Table 3**). Discriminant validity was assessed using the Fornell–Larcker criterion, and the results showed that the square root of the AVE for each dimension was greater than its correlation with other dimensions, indicating strong discriminant validity. The AVE was also calculated to evaluate convergent validity; all values were acceptable.

The composite reliability was > 0.70 for all dimensions. It ranged from 0.87 to 0.96 (0.91 for intention, 0.89 for attitude, 0.96 for subjective norms, 0.87 for perceived behavioral control, and 0.96 for knowledge), demonstrating a strong internal consistency across the five factors.

The internal consistency reliability was assessed using Cronbach's α. The calculated values were > 0.70 for all dimensions. They ranged from 0.80 to 0.92 (0.86 for intention, 0.80 for attitude, 0.92 for subjective norms, 0.82 for perceived behavioral control, and 0.92 for perceived knowledge), suggesting strong internal consistency across the five factors (**Table 3**).

Table 3. Cronbach's α, composite reliability (CR), square root of the average variance extracted (AVE) (in bold), and correlations between the constructs (off-diagonal) of the final NIPACP scale.

Factors	Cronbach's α	CR	AVE	A	B	C	D	E
Knowledge (A)	0.92	0.96	0.87	**0.93**				
Attitude (B)	0.80	0.89	0.60	0.19	**0.78**			
Subjective norm (C)	0.92	0.96	0.87	0.40	0.52	**0.91**		
Perceived behavioral control (D)	0.82	0.87	0.68	0.79	0.33	0.59	**0.83**	
Intention (E)	0.86	0.91	0.72	0.43	0.75	0.63	0.59	**0.85**

Note: CR = Composite reliability; AVE = square root of the average variance extracted

Discussion

This study is the first to culturally adapt and examine the psychometric properties of the theory-driven NIPACP, which assesses Thai nurses' intention to participate in ACP. The CFA results demonstrate the cultural adaptation of the scale to the Thai context, emphasizing the importance of conducting rigorous psychometric testing to accurately measure concepts of interest in a particular cultural setting.[23-26,28]

In our study, the TPB's key concepts, namely attitude, subjective norm, and perceived behavioral control, were explicitly reflected in the culturally adapted scale. The 'attitude' evaluates nurses' sentiments towards ACP, the subjective norm reveals societal pressures impacting their ACP involvement, and the perceived behavioral control uncovers perceived facilitators or obstacles to ACP.

Acknowledging the complexity of human behavior, developers and practitioners of TPB assert the necessity of extending it to optimize its practicality and utility.[39] In line with this, our assimilation of nurses' ACP knowledge into the TPB framework to decipher their intention to participate in ACP was appropriate and recommended, further substantiating the instrument's cultural adaptation and validity.

Both construct and discriminant validity were established to ensure distinct and non-overlapping constructs. Moreover, correlations between constructs, in line with TPB, affirmed the convergent validity of the scale. The superior model fit of the adapted version indicates that it better captured TPB concepts in the Thai healthcare context. Therefore, the cultural adaptation process successfully produced a tool that provides valid, reliable, and culturally appropriate measurements.[3,5,20]

To refine the instrument, we navigated the delicate balance between maintaining statistical rigor and preserving the essence of the concepts. For instance, we chose to omit the item "ACP destroys patients' or their family members' sense of hope," despite its conceptual importance. It had a factor loading of less than 0.6, indicating its relatively weaker contribution to the dimension, necessitating its removal for the overall dimension precision.[36-38] This is an example of the fine-tuning required to ensure the instrument's accuracy and relevance within the Thai context.

The reliability of the culturally adapted NIPACP scale is robustly supported by composite reliability and internal consistency reliability measures, which exceed the threshold of 0.70. This suggests that the items within each dimension were highly correlated, effectively measuring the same dimension. High reliability affirms the scale's applicability and stability in similar contexts.

Notably, this scale does not measure actual behavior but assesses one's intention to participate in ACP. The scale requires further testing to determine whether the subscales predict actual behavior. The results presented here were obtained only for the initial steps in establishing the construct validity. Although we suspect that the scale predicts participation in ACP

consistent with Ajzen's model, additional research using an actual behavioral ACP scale is needed to establish a relationship between intention and actual behavior.

Notwithstanding these results, future research needs to delve deeper into the qualitative facets of ACP, recognizing its inherent complexity and cultural nuances. This scale will enable a more comprehensive understanding of ACP across diverse cultural contexts and inform the development of culturally appropriate interventions.

Strengths and Limitations

This study has several strengths, such as the comprehensive measurement of all major concepts of TPB. The robust theoretical foundation, rigorous methodology (i.e., probability sampling, CFA, and expert panel), and the focus on the significance of knowledge within the Thai context all contribute to a deeper understanding of nurses' intentions to participate in ACP.

Despite its strengths, this study had several limitations. The potential recall or social desirability bias inherent in self-reported data may have affected the accuracy of the results. Moreover, although statistically adequate, the sample size was relatively small, and its representativeness may not encompass all Thai nurses, constraining the generalizability of the findings. Finally, this study primarily focused on CFA. However, in factor analysis, exploratory factor analysis (EFA) typically precedes CFA. The EFA helps identify the underlying factor structure without imposing a preconceived structure on the outcome.

On the other hand, CFA tests the hypothesis that a relationship exists between observed variables and their underlying latent constructs. Thus, future research should include EFA in the initial stages of tool validation before using CFA to promote its widespread use in the country. This approach provided a more comprehensive validation of the tool, ensuring its reliability and validity across different contexts within Thailand.

Conclusion and Implications for Nursing Practice and Policy Development

The culturally adapted NIPACP scale, featuring 20 items across five dimensions – 'knowledge' (4 items), 'intention' (4 items), 'attitude' (5 items), 'subjective norm' (4 items), and 'perceived behavioral control' (3 items) – offers a detailed understanding of Thai nurses' intentions for ACP participation. This tool equips healthcare professionals to craft interventions addressing barriers to ACP, such as knowledge gaps and attitudes, and inform the creation of training programs. However, before its widespread use, future research should include EFA in the initial stages of tool validation before using CFA to confirm its reliability and utility in diverse settings. Future research should assess the applicability of this instrument across various Thai regions, thus aiding the development of strategies promoting ACP participation and patient-centered end-of-life care. In conclusion, integrating these insights into policies can foster an environment conducive to ACP integration into Thai nursing practice, aligning with end-of-life care needs.

Conflict of Interest and Funding Source

There is no conflict of interest, and the Princess Mundharobh Kamalasna Foundation the necessary funding for the study, with no influence on the outcome.

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Appendix, Table 1: Factor loading of each item in the 36-item NIPACP scale

Factors	Items	Thai translations	Factor loading	Decision
Intention	1. I intend to participate in advance care planning with patients and their families.	1. ฉันตั้งใจที่จะร่วมวางแผนการดูแลล่วงหน้ากับผู้ป่วยและครอบครัว	0.866	Retained
	2. It is my plan to carefully mind the participate in ACP.	2. ฉันมีแผนการชัดเจนเกี่ยวกับการร่วมการดูแลล่วงหน้า	0.864	Retained
	3. I plan to participate in ACP in the next decision.	3. ฉันวางแผนเข้าร่วมการวางแผนการดูแลล่วงหน้าในครั้งต่อไป	0.902	Retained
	4. I plan to participate in ACP whenever I can.	4. ฉันวางแผนที่จะเข้าร่วมการวางแผนการดูแลล่วงหน้าเมื่อมีโอกาส	0.771	Retained
Attitude	1. ACP related to my current clinical duties.	1. การวางแผนการดูแลล่วงหน้ามีความเกี่ยวข้องกับบทบาทหน้าที่ของคุณ	0.781	Retained
	2. ACP can help to prevent disputes between health care team and family members on medical decisions.	2. การวางแผนการดูแลล่วงหน้า ช่วยลดความขัดแย้งในการตัดสินใจเกี่ยวกับการรักษาระหว่างทีมบุคลากรสุขภาพและญาติ	0.726	Retained
	3. ACP should be integrated into routine care services for patients with chronic illnesses.	3. การวางแผนการดูแลล่วงหน้าควรถูกกำหนดไว้ในการดูแลพื้นฐานที่ผู้ป่วยโรคเรื้อรังทุกคนควรได้รับ	0.787	Retained
	4. ACP conversation can be initiated by any health professional.	4. การเปิดการสนทนาเกี่ยวกับการวางแผนการดูแลล่วงหน้าสามารถทำได้โดยบุคลากรสุขภาพสาขาใดก็ได้	0.464	Deleted
	5. Better not to initiate ACP unless asked by patients or their family members.	5. การพูดคุยเกี่ยวกับการวางแผนดูแลล่วงหน้า ควรเริ่มเมื่อผู้ป่วยและญาติแจ้งความต้องการ	-0.075	Deleted
	6. ACP is helpful to clarify patients' goals and preferences for end-of-life care.	6. การวางแผนการดูแลล่วงหน้าช่วยให้เกิดความชัดเจนเกี่ยวกับความต้องการและเป้าหมายการดูแลในระยะสุดท้ายของผู้ป่วย	0.791	Retained
	7. ACP should be started early to allow time for contemplation.	7. การวางแผนดูแลล่วงหน้าควรเริ่มให้เร็วที่สุด เพื่อให้ผู้ป่วยมีเวลาไตร่ตรองเกี่ยวกับความต้องการในการดูแลในระยะท้าย	0.691	Retained
	8. ACP should not be started before the patients' condition worsens because their preferences may change according to the context.	8. ไม่ควรวางแผนการดูแลล่วงหน้าไว้ก่อนที่ผู้ป่วยจะมีอาการทรุดลง เพราะความต้องการของผู้ป่วยอาจเปลี่ยนแปลงได้ตามสถานการณ์	0.343	Deleted

Appendix, Table 1: Factor loading of each item in the 36-item NIPACP scale (Cont.)

Factors	Items	Thai translations	Factor loading	Decision
	9. Under no circumstances should life-sustaining treatments be withheld or withdrawn from patients.	9. ไม่ควรระงับหรือหยุดการรักษาที่ช่วยยืดชีวิตผู้ป่วย ไม่ว่ากรณีใด ๆ	0.099	Deleted
	10. ACP is not necessary because the use of life-sustaining treatments is a medical decision based on patients' best interests.	10. การวางแผนดูแลล่วงหน้า ไม่ใช่เรื่องจำเป็น เนื่องจากการตัดสินใจทางการแพทย์เกี่ยวกับการรักษาเพื่อพยุงชีพ พิจารณาจากประโยชน์สูงสุดที่เกิดกับผู้ป่วยอยู่แล้ว	0.48	Deleted
	11. ACP destroys patients or their family members' sense of hope.	11. การวางแผนการดูแลล่วงหน้าเป็นการทำลายความหวังของผู้ป่วยและญาติ	0.541	Deleted
	12. It is difficult to determine if the patient has the mental capacity to make medical decisions.	12. การประเมินว่าผู้ป่วยมีสติสัมปชัญญะสามารถที่จะตัดสินใจเกี่ยวกับการรักษาที่ต้องการได้หรือไม่ เป็นเรื่องยาก	0.342	Deleted
	13. Patients usually find end-of-life care discussion a taboo.	13. ผู้ป่วยมักคิดว่าการพูดถึงการดูแลในระยะท้ายของชีวิต เป็นเรื่องที่ไม่ควรพูดถึง	0.446	Deleted
	14. Patients usually find end-of-life care discussion difficult, e.g., difficult to understand the treatments or predict the future.	14. ผู้ป่วยมักคิดว่าการพูดคุยเกี่ยวกับการดูแลในระยะท้ายของชีวิตเป็นเรื่องยาก เช่น การทำความเข้าใจเกี่ยวกับการรักษาและการคาดการณ์สิ่งที่จะเกิดขึ้นในอนาคต	0.245	Deleted
	15. Patients' family members usually find end-of-life care discussion a taboo.	15. ญาติผู้ป่วยมักคิดว่าการพูดคุยเกี่ยวกับการดูแลในระยะท้ายของชีวิตเป็นเรื่องที่ไม่ควรพูดถึง	0.458	Deleted
	16. Patients' family members usually find end-of-life care discussion difficult, e.g., difficult to understand the treatments or predict the future.	16. ญาติผู้ป่วยมักคิดว่าการพูดคุยเกี่ยวกับการดูแลในระยะท้ายของชีวิตเป็นเรื่องยาก เช่น การทำความเข้าใจเกี่ยวกับการรักษาและการคาดการณ์สิ่งที่จะเกิดขึ้นในอนาคต	0.342	Deleted
	17. It is hard for patients and/or their family members to reach consensus on end-of-life care.	17. การบรรลุข้อตกลงร่วมกันเกี่ยวเกี่ยวกับการดูแลระยะสุดท้ายของชีวิตระหว่างผู้ป่วยและญาติ เป็นเรื่องยาก	0.201	Deleted

Appendix, Table 1: Factor loading of each item in the 36-item NIPACP scale (Cont.)

Factors	Items	Thai translations	Factor loading	Decision
	18. Documentation of ACP discussion is useful for care management.	18. แผนการดูแลล่วงหน้าเป็นประโยชน์สำหรับการจัดการดูแลผู้ป่วย	0.566	Deleted
	19. ACP can help to alleviate burden on family decision makers.	19. การวางแผนดูแลล่วงหน้า ช่วยลดความยากลำบากในการตัดสินใจของญาติได้	0.349	Deleted
Subjective norm	1. My seniors/supervisors support me to participate in ACP.	1. หัวหน้าสนับสนุนคุณให้มีส่วนร่วมในการวางแผนการดูแลล่วงหน้า	0.975	Retained
	2. My co-workers support me to participate in ACP.	2. เพื่อนร่วมงานสนับสนุนคุณให้มีส่วนร่วมในการวางแผนการดูแลล่วงหน้า	0.98	Retained
	3. The hospital policy supports me to participate in ACP.	3. หน่วยงานสนับสนุนคุณให้มีส่วนร่วมในการวางแผนการดูแลล่วงหน้า	0.918	Retained
	4. I am expected to participate in ACP seriously.	4. ฉันถูกคาดหวังให้มีส่วนร่วมในการวางแผนการดูแลล่วงหน้า	0.856	Retained
Perceived behavioral control	1. I am confident in participating in ACP.	1. ฉันมั่นใจในการมีส่วนร่วมวางแผนการดูแลล่วงหน้ากับผู้ป่วยและครอบครัว	0.831	Retained
	2. I am familiar with the hospital' policy regarding ACP.	2. ฉันคุ้นเคยกับนโยบายการวางแผนการดูแลล่วงหน้าของโรงพยาบาล	0.879	Retained
	3. I am comfortable with discussing end-of-life care issues with patients.	3. ฉันสามารถสนทนาประเด็นต่าง ๆ ในระยะท้ายของชีวิต กับผู้ป่วยได้อย่างสะดวกใจ	0.737	Retained
	4. I am hesitant to follow the preferences stated in the ACP form for fear of legal liability, especially if the patients have not signed an advance directive.	4. ฉันรู้สึกไม่มั่นใจในการปฏิบัติตามการความต้องการของผู้ป่วยที่ระบุไว้ในแผนการดูแลล่วงหน้า เนื่องจากกังวลว่าจะผิดกฎหมาย โดยเฉพาะอย่างยิ่งหากผู้ป่วยไม่จัดทำเอกสารและลงนามไว้	0.115	Deleted
	5. I do not have time to conduct ACP.	5. ฉันไม่มีเวลาที่จะทำการวางแผนการดูแลล่วงหน้ากับผู้ป่วย	0.199	Deleted
Knowledge	1. I have sufficient knowledge to participate in ACP.	1. ฉันมีความรู้เพียงพอที่จะร่วมวางแผนการดูแลล่วงหน้า	0.976	Retained
	2. I feel knowledgeable about ACP.	2. ฉันมีความรู้ความเข้าใจเกี่ยวกับการวางแผนการดูแลล่วงหน้า	0.969	Retained
	3. I understand the purpose of ACP.	3. ฉันเข้าใจเกี่ยวกับวัตถุประสงค์ของการวางแผนการดูแลล่วงหน้า	0.852	Retained
	4. I understand the process of ACP.	4. ฉันเข้าใจกระบวนการการวางแผนการดูแลล่วงหน้า	0.921	Retained

Note: ACP: Advance care planning

การทดสอบคุณสมบัติแบบประเมินความตั้งใจของพยาบาลต่อการร่วมวางแผนดูแลล่วงหน้า ฉบับภาษาไทย

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บทคัดย่อ: พยาบาลมีบทบาทสำคัญอย่างยิ่งในการวางแผนดูแลล่วงหน้ากับผู้ป่วยและครอบครัว แต่การมีส่วนร่วมของพยาบาลไทยในการวางแผนดูแลล่วงหน้าดังกล่าวยังมีปริมาณน้อย ดังนั้นการทำความเข้าใจความตั้งใจที่จะมีส่วนร่วมในการวางแผนดูแลล่วงหน้าของพยาบาลไทยจึงมีความสำคัญอย่างยิ่งยวด ต่อการพัฒนาโปรแกรมส่งเสริมการมีส่วนร่วมของพยาบาลในการวางแผนดูแลล่วงหน้า อย่างไรก็ตามในปัจจุบันไม่มีแบบประเมินที่เกี่ยวข้องกับมุมมองของพยาบาลไทยที่มีต่อการร่วมวางแผนดูแลล่วงหน้าฉบับภาษาไทย การศึกษานี้จึงเลือกแบบประเมิน Health Professionals' Experience and Attitudes Questionnaire on Advance Care Planning เพื่อปรับเนื้อหาข้ามวัฒนธรรม งานวิจัยนี้มีวัตถุประสงค์เพื่อปรับเนื้อหาข้ามวัฒนธรรม และทดสอบความตรงของแบบประเมินดังกล่าว ซึ่งการปรับเนื้อหาข้ามวัฒนธรรมนี้ประกอบไปด้วย 5 ขั้นตอน ได้แก่: (1) การแปลจากภาษาอังกฤษเป็นภาษาไทยและแปลย้อนกลับด้วยทีมผู้ทรงคุณวุฒิ (2) การปรับปรุงข้อคำถามโดยทีมผู้ทรงคุณวุฒิ (3) ทดสอบความตรงตามเนื้อหาและทดสอบความเข้าใจและความถูกต้องของแบบประเมินด้วยวิธีการสัมภาษณ์กับพยาบาลที่มีลักษณะคล้ายคลึงกับกลุ่มตัวอย่าง (4) ยืนยันความถูกต้องของแบบประเมินที่ได้รับการปรับเปลี่ยนเชิงวัฒนธรรมเบื้องต้น (5) ทดสอบความตรงและความเที่ยงของแบบประเมินโดยใช้การวิเคราะห์ปัจจัยยืนยัน กลุ่มตัวอย่างประกอบด้วยพยาบาลวิชาชีพ 260 ราย ด้วยอัตราการตอบกลับ 52% แบบประเมินความตั้งใจของพยาบาลต่อการมีส่วนร่วมการวางแผนดูแลล่วงหน้าฉบับภาษาไทย ประกอบด้วย 20 ข้อคำถาม แบ่งเป็น 5 องค์ประกอบ ได้แก่ ความตั้งใจ ทัศนคติ การคล้อยตามกลุ่มอ้างอิง การรับรู้ความสามารถในการควบคุม และความรู้ของพยาบาลต่อการมีส่วนร่วมในการวางแผนการรักษาล่วงหน้า ผลการศึกษาพบว่าแบบประเมินดังกล่าวมีความเที่ยง ความตรงตามสภาพ ความตรงตามโครงสร้าง และสัมประสิทธิ์ของความสอดคล้อง ทำให้เข้าใจมุมมองของพยาบาลได้ดีมากยิ่งขึ้น ดังนั้นแบบประเมินนี้จึงมีความเหมาะสมที่จะนำไปใช้ต่อไป ทั้งในการเป็นแนวทางการศึกษาวิจัยและวางกลยุทธเพื่อออกแบบโปรแกรมทางการศึกษาที่ส่งเสริมการมีส่วนร่วมและสมรรถนะของพยาบาลในการวางแผนดูแลล่วงหน้า และนำไปสู่การส่งเสริมคุณภาพการดูแล การสื่อสารระหว่างผู้ป่วยและทีมสุขภาพในการดูแลแบบประคับประคองอีกด้วย การวิจัยในอนาคตควรศึกษาเพิ่มเติมเกี่ยวกับการวิเคราะห์องค์ประกอบเชิงสำรวจ และทดสอบความเหมาะสมของแบบประเมินในกลุ่มพยาบาลวิชาชีพในภูมิภาคอื่นในประเทศไทย เพื่อเพิ่มประโยชน์ทางคลินิกและความสามารถในการนำแบบประเมินไปใช้ในภาพรวมด้วย

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